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CARCINOMA OF THE BLADDER

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Cape Town

Carcinoma of the bladder usually starts insidiously and treacherously, but its end is painful, miserable and severe in the extreme. It behoves us therefore to bear it in mind, to be on the lookout for it, and not to miss the diagnosis when an early case does present itself.

The *incidence* of the condition is fairly high, and it is far commoner in males than females. In big urology clinics, e.g. Groote Schuur Hospital, cases are seen quite regularly. In London hospitals like St. Pauls, St. Peters and the Middlesex, there are always a few cases of bladder carcinoma. In the Royal Cancer Hospital, London, and in the Holt Radium Institute at the Christie Hospital, Manchester, the numbers are frightening, but of course the cases are concentrated in those institutions.

The *etiology* in most cases is unknown, but it is recognized that those who work with certain aniline dyes and coal-tar compounds are especially prone to develop the disease, and D. S. Poole-Wilson, of Manchester, has had the unique opportunity of watching the development of the lesions and treating them in a great number of patients in whom these compounds were the cause. D. M. Wallace, of London, is working on the theory that people with a bladder-carcinoma diathesis secrete an enzyme in the urine which breaks down urinary constituents in such a way that they become carcinogenic. He and Cuthbert Dukes (the pathologist) may be on the brink of very important discoveries, and their paper on the subject was received very enthusiastically at the Urological Conference in Dublin last year.

Other rarer causes are bilharziasis, stone, chronic sepsis, leukoplakia, and diverticulosis.

The types are the same as in the rest of the body viz.:

1. malignant papilloma, characterized by stunted villi, a wide sessile base, and infiltration and puckering of the surrounding mucosa and deeper layers of the bladder. It is well known how a papilloma after years might become malignant; in fact, there are some who hold that every bladder papilloma is malignant to a lesser or greater degree.

2. nodular carcinoma, with or without spread and infiltration and ulceration.

3. ulcerative carcinoma, mainly destructive and very malignant.

The *spread* of the disease is (*a*) to other parts of the bladder by implantation, (*b*) through the bladder wall into muscle and paravesical tissues, and to adjacent organs, (*c*) to the regional lymph glands in the pelvis, and (*d*) more rarely, by blood stream to bone and lungs.

Dukes and Masina further classify bladder tumours into *Stages* I (IA, IB), II, III and IV, depending on whether the growth is confined to the bladder mucosa and muscle, the perivesical tissues, or the regional lymph glands, or is widespread and metastasized. The same authors also divide them roughly into 3 grades, depending on the degree of malignancy, but they realize that the grading may change after years and after treatment.

The *prognosis* depends on many factors—the grade of malignancy, the stage of spread, the site of the tumour, the age of the patient, his general condition, other diseases and complications, etc.

Symptoms

1. Haematuria. This may be brisk and persistent, but more often the patient will say that he passed blood on one occasion a little while back, but now he is quite well. It is in this type of case that we have to be on our guard. We shall find the patient not at all keen on further investigation, especially if a cystoscopy is mentioned, and we ourselves feel that perhaps we are unduly alarmed and cautious. It is so easy to assume that the patient probably had a mild cystitis—in fact there often is an associated cystitis and superadded infection—and valuable time may be lost by prescribing urinary antibiotics and getting temporary alleviation of symptoms; then, when the patient reports again, there is an inoperable fixed carcinoma.

2. Symptoms of cystitis, frequency, dysuria and strangury, mostly caused by infection. The symptoms

of carcinoma of the bladder, even in late cases may well be overshadowed by some other urinary condition. For instance, I saw an old man with urinary obstruction, a large prostate, and haematuria so mild that it might quite easily have been caused by his prostatic enlargement and bladder congestion. However, the cystogram of the intravenous pyelogram series showed a suspicious filling defect on the side wall of the bladder, which on cystoscopy and more careful investigation proved to be an inoperable carcinoma of the bladder.

About 8 years ago a European woman of 45 consulted me for frequency. The urine contained pus, a few red blood-cells and was heavily infected. There was a severe degree of ectropion and cervical erosion, and bimanual examination revealed a mass on the left side which I thought was an ovarian tumour fixed to the base of the bladder. Cystoscopy revealed a carcinoma the size of a small orange situated above the left ureteric orifice. At operation I had to do a total cystectomy, and a total hysterectomy with uretero-sigmoid transplant. This was an intelligent woman, yet her symptoms were minimal, and in fact could all have been explained away by her cervical condition. Had it not been for the presence of a mass fixing the bladder region to uterus, I should have had very little indication for doing a cystoscopy.

Diagnosis

The important point is to bear the condition in mind, particularly in elderly men, and in people in whom tuberculosis, prostatic disease, stone and bilharziasis can be excluded.

The urine should be examined for albumen, and a microscopic examination made for epithelial cells, pus cells, red blood-cells and signs of infection. A pathologist may find malignant cells in the urine.

Simple abdominal examination will reveal nothing unless large bladder tumours and secondary glands are present.

A urachal cyst or a carcinoma in a urachal cyst is rare, but must be differentiated. Bimanual examination (with one or two fingers in the vagina or rectum) is a most useful procedure, and with a relaxed abdomen, under a general anaesthetic if necessary, will reveal most malignant tumours if at all sizeable. Apart from diagnosis, bimanual examination assists greatly in determining operability. If the tumour is infiltrating, large, and fixed to pelvic tissues, fascia and bone, then as a rule complete eradication is virtually impossible.

A good intravenous pyelogram is often very helpful in two ways: (*a*) by showing a filling defect in the cystogram and (*b*) by showing hydronephrosis or non-functioning of a kidney resulting from obstruction of a ureter, obstruction being caused either by invasion round the ureteric opening or by glands along the pelvic brim. On two occasions I have seen a filling defect of the bladder and severe hydronephrosis caused by a large bladder diverticulum; the ureter was between diverticulum and bladder and thus obstructed; the diverticulum was full of urine, which did not allow the dye to enter it, thus giving a filling defect. The smoothness of the filling defect and, of course, cystoscopic appearances indicated the right diagnosis. Careful cystoscopic examination is essential, and the bladder is to be searched all the way round, systematically, remembering that the apex can often only be viewed properly with the organ half collapsed. In many cases it is fairly easy to differentiate the frons of the papilloma from the shorter finger-like stunted processes of the malignant papilloma or the malignant ulcer or malignant nodular growth; but in many cases there is real doubt, and a biopsy taken with a Lowsley's punch forceps, a resectoscope or Thompson's punch is essential.

Puckering or scarring and drawing-in of the surrounding bladder wall and the breaking out of smooth nodules in the vicinity of the parent tumour indicate malignant infiltration. The presence of a multitude of tumours is against malignancy, but the finding of two or more tumours by no means excludes carcinomata. The possibility of a primary tumour in the kidney, pelvis or ureter, with seedling spread down that ureter, must be born in mind.

Sigmoidoscopy or proctoscopy in advanced cases may show invasion or recto-vesical fistula, depending on the position of the tumour.

TREATMENT

In advanced cases this is disappointing, and hence the importance of early diagnosis and the regular follow-up of those who have had their papillomata treated. There are many methods of handling carcinomata of the bladder, but I will try to evaluate the different methods as used in various centres I visited in 1954, and the different methods of approach as influenced by site, size of tumour, stage, spread etc.

A. *Partial Cystectomy*

This is primarily indicated for the tumour situated at or near the apex of the bladder. If tackled early, before infiltration through the bladder wall and into the structures of the anterior abdominal wall has occurred, the chances of eradicating the disease are better in this site than anywhere else. The bladder is filled with 1/1,000 silver nitrate before the operation, and the wound is carefully packed with swabs wrung out in the solution before opening the organ, in an effort to prevent spilling and seedling secondaries. Sometimes this procedure is combined with implantation of radon or gold seeds.

B. *Transurethral Resection and Fulguration*

This operation is performed for instance by Milner, of New York. It requires skill and judgment, because one must continue to resect away tumour right until normal bladder muscle is reached, and this is obviously not practicable where invasion is too deep. It is possible to combine transurethral implantation of radon seeds.

C. *Total Cystectomy*

With uretero-sigmoidostomy, or cutaneous ureterostomy, or implanting ureters into an isolated loop of ileum with a permanent ileostomy bag to collect urine, or into a caecal substitute bladder.

The following are the pertinent arguments for and against the various available methods:

1. With a localized tumour in the apex, total cystectomy is unnecessary.

2. If the tumour is in the base or lower half of the bladder, and if it has spread through the bladder wall into perivesical tissues, then total cystectomy might get it all away; but the chances of cure are small, and in fact an operation might promote dissemination of the growth. With a very radical resection of all the loose tissues and glands of the pelvis, a successful result may be obtained in some cases, but the pros and cons must be considered carefully in each case, bearing in mind the gravity of the operation, the risk of pyelonephritis and changes in electrolytes with uretero-sigmoid transplants, and the inconvenience of cutaneous drainage of urine.

3. Other methods, dealt with below, are available for cases where the tumour is just beginning to invade the perivesical tissues.

Total cystectomy is therefore ideally reserved for:

(*a*) Very numerous papillomata, where it would be impossible to fulgurate them all.

(*b*) Recurrent papillomata, or where fulguration has not had the desired or expected results.

(*c*) Early multiple carcinomata, where the tumours have not spread through the bladder wall, yet, because of multiplicity, local resection or local treatment with radio-active agents is not feasible.

(*d*) Early cases that have not responded to radon or radio-active tantalum.

(*e*) Severe haemorrhage which does not stop with blood transfusions etc.

(*f*) Bleeding telangiectatic areas following radiation.

(*g*) Painful contracted bladders following radiation.

(*h*) Carcinoma in a diverticulum; here it is virtually impossible to do a simple diverticulectomy without 'spilling', because of thin walls, adhesions and inaccessibility.

(*i*) In some instances—where there are severe pain and strangury and the patient's life is made miserable by the passage of blood clots, thick pus and pieces of carcinoma breaking away—arguments can be raised in favour of total cystectomy as a palliative measure.

(*j*) Five-year cures have been achieved by means of radical cystectomy, and the clearing of all the soft tissues of the pelvis and the glands as far as the pelvic brim; and, providing there is not gross fixation and infiltration, these radical procedures may be justified in some cases especially in view of the irritable small painful contracted bladders which may follow the alternative method of deep X-ray therapy.

D. *Removal of the Tumour plus Irradiation*

In this method the bladder is opened suprapubically, always with due care to prevent seedling spread by means of silver nitrate instilled into the bladder and by applying packs soaked in the solution in the pelvis. The tumour is pared away with a loop electrode and then one of several irradiating procedures is adopted, the implication in this group of cases being that mere local resection is not enough, and that there is some degree of local infiltration in the bladder wall and perhaps slightly beyond. Furthermore, this method is applicable particularly for tumours on or near the bladder base and trigone and round about the urethra. (If the tumour lies on or near the ureter, this fact is ignored; in practice there are usually no untoward results from so treating the area where the ureter lies.)

(*a*) Higham uses an inflatable rubber bag shaped like a bladder. To this he applies radium needles over the area where the tumour sits, the position and size of the tumour having been gauged cystoscopically before the operation. The needles are kept on the surface of the bag in much the same way as one applies a rubber patch to an inner tube; and the double tube which drains the bladder and inflates the bag is brought out *via* an urethrostomy opening.

The bladder is closed over the inflated bag, X-rays are taken to check the position of the needles, and having been given the time that the needles must stay in by a physicist so as to give roughly 7,000 r, one knows when to deflate the bag and remove it *via* the urethrostomy opening.

(*b*) Poole-Wilson, at the Holt Radium Institute, Manchester, pares away the tumour and then implants either radon or gold seeds into the base of the tumour, using a simple apparatus like a trocar and cannula, the needles staying for good. The bladder is closed in 3 layers.

(*c*) H. P. Winsbury-White and a few others still implant radium needles, bringing their threads out suprapubically, so that a period of suprapubic drainage becomes necessary.

(*d*) J. Swinney, of Newcastle-on-Tyne, has used liquid radio-active gold instilled directly into the bladder. The liquid is kept in for a few hours and the process repeated 2 or 3 times at intervals. He claims excellent results in the few cases in which he has used this method, but they were all cases with multiple tumours, not infiltrating, and more like papillomata or superficial carcinomata. For the same type of multiple tumour-formation, Wallace uses radio-active bromide in a large balloon inserted *via* a urethrostomy opening and with a side-opening to keep the bladder empty of urine. The bromide is coloured with a dye so that it will be known if the bag should burst. This substance delivers a high homogeneous irradiation for 5 mm. outside the surface of the bag; thus it is of no use if there is deep infiltration of the tumours, but it is ideally suitable for superficial growths, because the bladder muscle does not become irradiated. The one drawback in South Africa is that radio-active bromide has a short half-life, and for use here it is necessary to time its delivery from overseas accurately by the day of operation. The solution is kept in place for an hour and the bag then removed, the process being repeated weekly for 3 applications, aiming at a total dosage of 6,000 r. Wallace claims 60% tumour sterilization without bladder contraction, if the correct application is used in properly selected cases; his further results will be watched with great interest.

(*e*) Some use radon seeds delivered from a gun-and-trigger mechanism, the distribution being made even

and regular by applying the nozzle through loops or holes of a wire bent into a definite pattern and size.

(*f*) Solid radio-active cobalt is used by a few, the cobalt being kept in the centre of the bladder by means of an inflatable bag with a central catheter for the cobalt and an outer catheter for urine.

(*g*) The method which has impressed me most is the one developed by Wallace in the Royal Cancer Hospital, London. He pares away redundant tumour, and then transfixes the base of the tumour with hairpin-like loops of tantalum wire (radio-active). These are threaded into the bladder wall with a simple but clever device which fits on to an ordinary boomerang needle, and consists of two slightly curved hollow injection needles welded 1 cm. apart. Radio-active tantalum wire is active for at least ½ cm. from the centre, so that if the wires are all 1 cm. apart one knows that the area, plus ½ cm. of circumference, is being treated to a depth of at least ½ cm. The loops of these wires are attached to a urethral catheter, the bladder closed in layers; and, after the requisite amount of radiation has been given, the catheter is pulled out, the wires following. If for some reason or other the dose was too small, it can be supplemented by a small dose of deep X-ray therapy. With this method the following advantages are obvious:

(i) Tantalum has a half-life of 3½-4 months, which means that we can stock it here in South Africa, whereas gold and radon seeds have a half-life of only 2-4 days, meaning that by the time it arrives here by air from the atomic pile in Harwell, half the strength has already been lost. Application therefore has to be timed very accurately when gold or radon seeds are used, whereas with tantalum there is ample time.

(ii) The method is easy and requires very little extra apparatus.

(iii) The bladder can be closed and drained trans-urethrally.

(iv) The distribution of the wires is accurate and even, since tantalum wire is soft and pliable.

(v) Tantalum wire is inexpensive and can be reactivated if necessary. To filter off the harmful beta rays, it is covered with thin platinum, allowing mainly gamma rays to go through.

(vi) In suitable cases the results are good, there is a fair degree of penetration of rays, and there is no disturbance of the body's natural planes of defences.

(vii) The patient keeps his bladder and one avoids the nuisance of ureteric transplants, ileostomies or ureterostomies, and the dangers of pyelonephritis andelectrolyte imbalance.

E. *Deep X-ray Therapy*

This method is usually reserved for the hopeless type of case, so that it is difficult really to determine its value as a curative agent. There are some surgeons, notably Poole-Wilson, who say that the results are better than what is usually thought and taught. Not everyone agrees that the patient is usually left with a small irritable painful bladder after X-ray therapy, and now that more and more super-voltage plants are being built, this method might quite well gain popularity. The super-voltage machine acts on 2-4 million volts, consists of heavy expensive machinery, and is housed in large rooms with thick protected walls; but the rays are so penetrating that the skin is not burnt and each treatment takes a minute or less. The position of the tumour, its size, type etc. are all determined by careful cystoscopic and radiological means beforehand, and the powerful rays are then focussed on the very spot, from different directions and angles every day.

This type of therapy is used (*a*) for some papillomata, (*b*) to supplement the dose as given by radio-active materials, when for some reason or other an inadequate dosage has been applied, and (*c*) in cases where it is felt that the tumour has spread so extensively in the pelvic tissues that total cystectomy will not get it all away, and radio-active implants will not penetrate deeply enough to cover the whole extent of spread.

In many cases, if not cured, then at least some months of alleviation are given and, if an irritable bladder is produced, cystectomy can still be resorted to.

SUMMARY

An appeal is made for early diagnosis of carcinoma of the bladder.

The symptoms, signs and diagnostic features are described.

A short résumé of the various methods of treatment at our disposal is set out, pointing out the usefulness of tantalum wire.

OPSOMMING

Karsinoom van die blaas bring 'n haglike einde, en dis ons plig om nie die kondisie uit die oog te verloor en dit sodoende buite rekening te laat nie.

Die simptome en kentekens word beskryf.

Die verskillende metodes van behandeling word kortliks bespreek, en klem word gelê op die nut van radio-aktiewe tantalumdraad.

UNION DEPARTMENT OF HEALTH BULLETINS

Union Department of Health Bulletins. Report for the 7 days ended 22 September 1955.

Plague, Smallpox, Typhus Fever: Nil.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Calcutta, Dum Dum (India); Dacca (Pakistan).

Smallpox in Phnom-Penh (Cambodia); Allahabad, Cannanore (India); Dacca, Karachi, Lahore (Pakistan).

Typhus Fever: Nil.

Report for the 7 days ended 29 September 1955.

Plague, Smallpox, Typhus Fever: Nil.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Dacca (Pakistan).

Smallpox in Kabul (Afghanistan); Moulmein, Rangoon (Burma); Phnom-Penh (Cambodia); Kozhikode, Madras, Tellicherry (India); Dacca, Lahore (Pakistan); Saigon-Cholon (Viêt-Nam).

Typhus Fever: Nil.

South African Medical Journal

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VAN DIE REDAKSIE

GEVARE BY BEHANDELING VIR MAAGSERE

Tot 'n mate is mediese behandeling vir 'n maagseer doeltreffend en waardevol, maar tog kan ons nog baie daarop verbeter. Bowendien het die middels wat vandag algemeen gebruik word, ook maar hul nadele.[1-3] Veel navorsing moet nog gedoen word, maar ons het reeds baie kennis opgedoen insake die relatiewe verdienstelikhede van die verskillende samestellings wat as teensure gebruik word om 'n oormaat van soutsuur in die maag te neutraliseer of te absorbeer.

'n Paar navorsers het reeds verslag gedoen oor een van die minder bekende gevare van teensuurbehandeling, nl. die neerslae van kalsium wat in die weefsels vorm. Kensketsend hiervan is die ontwikkeling van halfmaanvormige letsels teen die kante van die horingvlies en klein kristalagtige massas in die bindvlies, wat veroorsaak word deur 'n kalsiumneerslag in die oogvliese. Ander liggaamsdele word ook aangetas; 'n kalsiumneerslag vorm bv. in die nierbuisies, in die onderhuidweefsel, in die longe en in die wande van bloedvate. Daar is 'n vermeerdering van kalsium in die serum tot selfs 15·8 mg. per 100 ml. Alhoewel die kenmerke hierbo genoem nie waarneembaar mag wees nie, sal 'n vermeerdering van bloedurea daarvan getuig dat die niere aangetas is. Vomeer en ontwatering mag verdere veranderings in die biochemie van die bloed teweegbring.

Dit is glad nie verbasend dat sulke veranderings plaasvind nie, want pasiënte drink dikwels groot hoeveelhede melk, tesame met herhaaldelike dosisse teensuurpoeiers wat dikwels kalsium karbonaat bevat.

Dit is opvallend by hierdie siekte dat wysiging van dieet so vinnig die metaboliese veranderings kan regstel. Die uitskakel van melk uit die dieet en 'n vermindering van die inname van kalsium, bring baie gou (selfs binne 'n paar dae) die verhoogde serum-kalsium af na die normale; die bloedurea verminder en die niere se werking verbeter. Teensure soos magnesium trisilikaat en aluminium hidroksied, wat nie geabsorbeer kan word nie, moet gegee word in plaas van alkaliese poeiers wat makliker opgeneem word. Natuurlik sal melk nog gebruik word, maar dit is miskien belangrik om die gebruik van alkaliese poeiers in te kort en voorkeur te gee aan die onoplosbare teensure wat nie geabsorbeer word nie.

Dit is bekend dat mondelinge toediening van alkali die uitskeiding van kalsium in die urine verminder—insgelyks die neem van anorganiese fosfaat. Melk bevat baie kalsium en fosfor, en tesame met die gebruik van teensuurpoeiers, mag dit 'n belangrike rol speel in die

EDITORIAL

THERAPEUTIC DANGERS IN PEPTIC ULCER

The medical treatment of peptic ulcer, although effective and valuable to a degree, still leaves much to be desired. Moreover the agents currently in widespread use are not entirely without their disadvantages.[1-3] Much work has been done and much is known with regard to the relative merits as antacids of the various compounds used to neutralize or absorb excess of hydrochloric acid in the stomach.

A lesser known danger of antacid treatment has been reported by a few investigators. This is the occurrence of deposits of calcium in the tissues. Most characteristic have been the development of crescentic lesions at the margins of the cornea and small crystalline masses in the conjunctiva from the deposition of calcium in the membranes of the eye. Other sites become involved also, as for instance the deposition of calcium in the kidney tubules, subcutaneous tissues, lung, and arterial walls. An increase in the serum calcium occurs, even up to 15·8 mg. per 100 ml. Although the characteristic features referred to above may not be seen, there may be evidence of renal impairment as revealed by an increase in the blood urea. Vomiting and dehydration may bring on other changes in the biochemistry of the blood.

It is not surprising that such changes may occur, since patients often consume large quantities of milk together with frequent doses of antacid powders, in which calcium carbonate is often present.

A remarkable feature of the disorder is the rapidity with which modification of the diet can correct the metabolic changes. The elimination of milk and a diet low in calcium quickly (within a few days possibly) reduces the elevated serum calcium to normal, and a decrease in blood urea occurs, with improvement in kidney function. The non-absorbable antacids such as magnesium trisilicate and aluminium hydroxide are given in place of the more readily absorbed alkaline powders. Milk will naturally continue to be used but it would seem important to restrict the use of alkaline powders in favour of the insoluble non-absorbable antacids.

The administration of alkali by mouth is known to decrease the urinary output of calcium, and so does the

meganismus wat hierdie simptomegroep veroorsaak. Aan die ander kant het die meeste van die pasiënte by wie hierdie kenmerke voorkom ook tekens van belemmerde nierwerking getoon. Die beskadigde niere was miskien nie daartoe in staat om kalsium doeltreffend uit te skei nie, sodat die hoeveelheid daarvan in die bloed vergroot is. Dit is vandag miskien moeilik om 'n juiste skatting te maak van die rol wat nieraantasting in die ontwikkeling van hierdie sindroom speel. By sommige gevalle, waar daar 'n snelle verbetering plaasgevind het in die bloed en nierwerking nadat kalsium en absorbeerbare alkali in die dieet ingekort was, is daar geen blywende tekens van nierbeskadiging nie. Maar by ander gevalle waar daar soortgelyke verbetering was, kom daar maar nog altyd tekens voor dat die niere aangetas is. Hierdie feite bewys dat verdere navorsing nodig is om die probleem op te los.

Voor ons 'n diagnose van die melk-alkali sindroom maak, moet ander kondisies eers oorweeg en uitgeskakel word. Hipervitaminose-D (as gevolg van oormatige inname van die antirachitis-vitamien) lei tot groter absorpsie van kalsium en fosfor in die derms, meer kalsium in die serum en urine, en 'n neerslag van kalsium in die weefsels sowel as in die niere, waarvan die werking belemmer mag wees. Wanneer die diagnose gemaak word, is dit natuurlik belangrik om die geskiedenis van die pasiënt noukeurig na te gaan. Oormatige werking van die byskildklier mag ook verantwoordelik wees vir te veel kalsium in die bloed en vir ander kenmerkende veranderings, waaronder oormatige urine-uitskeiding van kalsium gewoonlik tel.

Geneeshere verskil baie in mening omtrent die waarde van die verskillende middels vir die behandeling van maagsere; heelwaarskynlik sal pasiënte en geneeshere nog maar voortgaan met die gebruik van teensure om die pyn en ander simptome van hierdie algemene kondisie te versag. Die moontlike belangrikheid van die keuse van 'n veilige middel is hier kortliks geskets.

1. Annotasie (1955): Nutr. Rev., **13**, 199.
2. Snapper, I. *et al.* (1954): Arch. Intern. Med., **93**, 807.
3. Kessler, E. (1955): Ann. Intern. Med., **42**, 324.

ingestion of inorganic phosphate. Milk has a high content of calcium and phosphorus and this together with the antacid powders may be important factors in the mechanism producing the syndrome described. On the other hand, most of the patients in whom these features have been described have had evidences of impaired renal function. The damaged kidneys may have been unable to excrete calcium properly so that its level in the blood became increased. It is at present difficult to assess fully the importance of kidney damage in the development of the syndrome. In some cases where rapid improvement in the blood and in renal function has occurred after calcium and absorbable alkali have been restricted in the diet there is no remaining evidence of renal damage, while other cases where similar improvement has taken place continue to show evidence of renal dysfunction. These facts demonstrate that more studies will be needed to clear up this problem.

Before making a diagnosis of the milk-alkali syndrome other conditions will need to be considered and excluded. Hypervitaminosis D resulting from the excessive intake of the antirachitic vitamin leads to increased absorption of calcium and phosphorus from the intestine, increase in the serum calcium and its urinary output, and deposition of calcium in tissues, including the kidneys, whose function may be disturbed. Careful history-taking is of course important in making the diagnosis. Hyperparathyroidism may also produce hypercalcaemia and other characteristic changes, including usually a marked increase in the excretion of calcium in the urine.

There are wide differences of opinion among physicians on the value of drugs in the treatment of peptic ulcer; but it is probable that patients and physicians will continue to make use of antacids to reduce pain and other symptoms of this common disorder. The possible importance of selecting safe agents has been briefly indicated.

1. Annotation (1955): Nutr. Rev., **13**, 199.
2. Snapper, I. *et al.* (1954): Arch. Intern. Med., **93**, 807.
3. Kessler, E. (1955): Ann. Intern. Med., **42**, 324.

THE CONGRESS

The 40th South African Medical Congress, in Pretoria, is now due. It will be inaugurated on Sunday, 16 October with a Church Service and the public lecture, and it is anticipated that the Congress proceedings throughout the week will attain a high level of excellence. The Governor-General will grace them with his presence and His Excellency and Mrs. Jansen will receive members at a Garden Party at Government House, Pretoria.

The Pretoria Centenary celebrations in their jacaranda-time setting will provide a background for the Congress which will add to its *éclat*, and members of Congress will be entertained by the Mayor of the City.

Dr. J. H. Struthers, President of Congress, and his colleagues are to be congratulated on an impressive programme of events. The two 4-hour plenary sessions are to be devoted to the important subject of Cancer—its etiology and diagnosis, and its treatment. At each of these sessions 6 papers will be presented, several of them by distinguished British visitors. At the sessional meetings 138 individual papers are appointed for presentation—a truly formidable programme. A feature of the Congress is the number of overseas doctors who will attend and read papers.

It is expected that the exhibitions will be 'on a much grander scale than ever before'. The Trades Exhibition has for many years been an important central feature of Medical Congresses; this year 46 firms are to participate, and members will find in the exhibition much to see of interest and value. The scientific exhibition and the exhibition of doctors' hobbies have been growing in scope and interest in recent years, and should also be most attractive features.

An interesting programme has been arranged of visits to places of scientific and general interest and of social

entertainments. One afternoon in the week is left free for sporting events. Provision has been made for ladies accompanying members of Congress and a special ladies, programme will be issued for their convenience.

The occasion of Congress has as usual been taken to call the annual meetings of the Medical Association of South Africa and of its numerous Groups.

A congress of this magnitude throws a vast amount of work on its organizers, and the whole Association is indebted to the Pretoria doctors and their friends who have undertaken this task.

REVISION SERIES

XV. THE ALLERGIC PATIENT IN SOUTH AFRICAN MEDICAL PRACTICE

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The manifestations of an allergic disease may for practical purposes be regarded as the effect of provocative allergens or agents on persons with inherent or acquired hypersensitivity. Such allergens or agents are exogenous or endogenous depending upon their origin. A broad working classification of the commoner allergic conditions with their associated allergens is given in Table I (on next page).

It will be observed that *endogenous* factors—physical, endocrine, infective and psychological—play a part in the production of clinical manifestations in almost any allergic disorder. They may be primary factors or operate in conjunction with exogenous allergens.

DIAGNOSIS

In the approach to his allergic patients it is necessary for the physician to have a knowledge of the climate of the different parts of the country and to be acquainted with the distribution and pollination times of the principal local plants that cause hay fever. In South Africa where, besides the Europeans, the population consists of Africans, Eurafricans and Indians, he should be familiar with the living conditions, dietary habits and racial or tribal customs of these different peoples because these factors may be etiologically important in the pattern of their allergy.

In general an allergic etiology may be suspected in a patient if the symptoms are consistently provoked by the same agents or occur at the same season of the year. An allergic basis for any condition in which the etiology is not established should be considered if there is a history of allergy in the family or if the patient himself has previously manifested or is at present showing obvious allergic symptoms.

A thorough clinical examination is an essential preliminary to allergic investigation. The physician, ear nose and throat surgeon, ophthalmologist or dermatologist should first be satisfied that neither infection nor organic disease adequately explains the symptoms.

The most revealing element in the study of the allergic patient is his history and the history of allergy in his family. The seasonal or perennial character of the patient's allergic symptoms must be recorded and, if seasonal, the months in which they occur. The association of the patient with animals as pets or in the course of his business or hobbies should be inquired into. Persons sensitive to cats, dogs or horses are generally aware of such sensitivity, but young children often improve in allergic health when the cat or dog is no longer allowed in their bedrooms. Inquiry should be made about bedding because feather-sensitive people may be the victims of respiratory allergy from their pillows or eiderdowns. Coir and other mattresses, especially if old, may harbour fungus spores provoking respiratory symptoms. Moulds also grow in damp houses and the question of musty smells in particular rooms at home should be considered. The patient's occupation may be relevant to his symptoms, as in the carpenter's asthma when working with particular types of wood or the contact dermatitis in the orange-picker on the farm. Investigation of the patient's dietary may show that the eating of certain foods is followed by nausea, biliousness, colic or diarrhoea, skin eruptions or respiratory symptoms. It is wise to elicit from the parents whether a child is disciplined at home to eat foods which he dislikes simply because 'they are good for him'. Such foods may be wholly or in part responsible for the allergic manifestations. Sensitivity to drugs by mouth or by injection should be noted. Aspirin sensitivity is usually known to the patient, but he may be taking medicines containing aspirin or some other drug to which he is sensitive. Sensitivity to antibiotics and other biological products, including insulin, should especially be remembered for the patient may be receiving such treatment for an unrelated condition. Information suggestive of an allergic background will be obtained from a history of previous nasal surgery, recurrent nasopharyngeal infections ('sore throat'), chest complaints ('bronchitis') or frequent bouts of intestinal disturbances (colic and diarrhoea).

Allergy of the respiratory tract will be the main theme of this discussion as it is the form of allergy most commonly seen in general practice. Brief reference however is made here to allergic conditions of other systems.

Ocular Allergy. Urticaria and eczema of the eyelids are often correctly diagnosed as of allergic origin either of the atopic or contact-dermatitis types. Conjunctivitis may be the sole manifestation of a sensitivity to pollen or other inhalant substance. Spring catarrh occurring

TABLE I. THE COMMONER ALLERGIC DISORDERS AND THEIR POSSIBLE ETIOLOGICAL FACTORS

Seasonal hay fever and asthma (pollinosis) *Pollens*	* INHALANTS House dust Industrial dusts Feathers Animal danders Air-borne fungi, etc.
Nasal and paranasal allergy (Vaso-motor rhinitis and sinusitis) *Bronchial asthma* Inhalants* Foods Drugs† Endogenous factors††	† DRUGS including Antibiotics and Biological products
Atopic eczema Inhalants* Foods Drugs† Endogenous factors††	‡CONTACTANTS Plants Woods Textiles Furs Plastics Metals Dyes Drugs Chemicals Soaps Cosmetics, etc.
Urticaria *Angioneurotic oedema* Inhalants* Foods Drugs† (by injection or ingestion) Serum injection Insect bites and stings Contactants‡ Endogenous factors††	††ENDOGENOUS FACTORS may be significant either primarily or in association with exogenous allergens: *Physical* Heat Cold Light Pressure Climate, etc. *Endocrine* Adolescence Menstruation Pregnancy Menopause Hypothyroidism, etc. *Infective* Bacterial Parasitic Fungal, etc. *Psychological* Anxiety Frustration Hostility Fear Anger, etc.
Contact dermatitis Contactants	
Gastro-intestinal disorders (nausea, vomiting indigestion, colic, diarrhoea, mucous colitis, acute abdominal distress) Foods Endogenous factors††	
Conjunctivitis *Blepharitis* *Keratitis* *Iritis* Pollens Inhalants* Foods	
Headache *Migraine* Inhalants* Foods Endogenous factors††	
Serum sickness *Anaphylactic shock* Serum injection	

in persons with other allergic symptoms or with a family history of allergy may or may not prove truly seasonal. Eosinophils are often seen in conjunctival smears. The allergens etiologically related to the condition may however be elusive, for skin tests do not always reveal the cause. Iritis and keratitis may also have an allergic basis.

Allergy of the Ear. Allergic conditions of the ear are not infrequently seen. Eczema of the external auditory meatus and adjacent structures may be associated with sensitivity to drugs, food and bacteria, and also as the effect of contact with cosmetics and soaps, as well as to earrings and spectacle frames. Allergic factors should be considered in recurrent acute otitis media in children and also when chronic. The symptoms of allergy in the inner ear manifested as tinnitus, vertigo and partial deafness may be due to oedema of parts of the cochlea or vestibular apparatus. Simultaneous allergic manifestations elsewhere in the patient will confirm a suspicion of ear allergy.

Allergy of the Central Nervous System. Certain morbid conditions of the central nervous system not otherwise etiologically explained may have an allergic origin. Allergic headache is a well-recognized entity and is generally due to food sensitivity. Not all migraine is allergic but every migraine sufferer should be given the benefit of an allergic investigation. Diet studies not infrequently incriminate one or more foods and their avoidance may bring relief.

Skin Allergy. Atopic eczema is a reaction of the skin of allergic origin. The use of medicated ointments and lotions cannot ameliorate the basic condition but may initiate further sensitivities and expose the hypersensitive skin-tissues to superimposed infection and further complications. Usually contact dermatitis is readily diagnosed and its cause easily elicited from the history or by patch tests with the suspected materials. Skin lesions of minor or major character may however escape recognition as hypersensitivity reactions to bacterial and fungal invasions; for example, the generalized secondary skin eruptions following athlete's foot infection. Eczema in infancy and childhood is frequently an atopic manifestation of some specific allergic effect of foods, particularly egg, milk, wheat, tomato and orange. True allergic contact-dermatitis due to wool should be remembered in babies and infants. Urticaria and angioneurotic oedema are often allergic in origin but etiological diagnosis and control may present much difficulty because endogenous factors are often of primary importance.

Gastro-intestinal Allergy. Allergy of the gastro-intestinal tract should be borne in mind in clinical diagnosis. The physician after eliminating possible organic factors should be on his guard against overlooking food or other allergens in gastro-intestinal maladies ranging from slight nausea and vomiting to severe colic and diarrhoea. Acute allergic upsets of the digestive tract may even simulate acute abdominal emergencies. Intestinal allergy is usually associated with other allergic manifestations, which give a clue to the etiology. Skin tests with food extracts are not reliable, since those giving positive reactions are not necessarily clinically significant, and *vice versa.*

Injectant Allergy. Allergic reactions associated with injections of drugs, antibiotics or therapeutic sera are readily recognized. More or less serious reactions from bee-stings, including anaphylactic shock, asthma and urticaria, are met with in South Africa, particularly in the rural areas. The use of protein extracts in desensitization may become imperative in hypersensitive persons who cannot by the nature of their work, residence or employment avoid being stung.

Respiratory Allergy

Respiratory allergy is either seasonal in character (*hay fever* or *pollinosis*) or perennial (*vasomotor rhinitis, sinusitis, bronchial asthma*).

The recognition of hay fever, vasomotor rhinitis, sinusitis and bronchial asthma presents little difficulty. It is, however, easy to overlook the allergic origin of constant or recurring 'colds', perpetual sniffing or coughing, or congested or running nose, especially in children. In such patients the mucous membrane of the nose and paranasal sinuses are characterised by pallor, bogginess and possibly polyposis. Laboratory investigations are often helpful. The finding of eosinophils in the blood, watery nasal secretions or sputum is further evidence of allergic etiology. Smears from mucopurulent nasopharyngeal discharges showing eosinophils as well as neutrophils are indicative of a microbial infection superimposed on a basic allergic condition.

(*a*) *Hay fever* (*pollinosis*) is a catarrhal condition of the nasal and ocular mucous membrane occurring in a person hypersensitive to the pollens present in the atmosphere at the time. It is characterized by sneezing, nasal congestion or watery nasal discharge, lacrimation, and itching of the nose, throat and eyes. The patient is usually aware of the strictly seasonal character of his condition, thus providing a clue to the pollen involved. Bronchial asthma also sometimes has a similar pollen etiology. The following is a brief summary of pollinosis in South Africa.[1]

Summer hay fever occurs from October to March with a maximum incidence in December, January and February and is due to the pollen of grasses which flower in that period. The suspected sensitivity is readily confirmed by skin-testing with grass-pollen extract. Pollinosis may also be due to the Compositae group of plants, including garden flowers (daisies, dahlias, asters, etc) and veld flowers (cosmos, khaki weed, etc). The Compositae pollinate mainly in the spring and summer but some species flower throughout the year. It is doubtful, however, whether these pollens which are not windborne are of much significance except in persons who come into close contact with the flowers. Cypress (*Cupressus spp.*) is the only tree of any importance in South African inhalant allergy. It flowers in the winter and spring (June to October) and skin tests with cypress-pollen extract will of course confirm this sensitivity. Hay fever confined to the spring (September to November) is due to tree pollens, of which the specific one is found by appropriate skin tests. Experience in this country has shown that, despite popular opinion, the pollens of acacia, pepper tree, privet, pine and blue-gum (eucalyptus) rarely give rise to clinical hay fever although positive skin-reactions thereto may occur.

As avoidance of pollen inhalation in the season is not practicable, treatment is best carried out by desensitization with extracts of the specific pollens to which the patient has reacted by skin test.

(*b*) *Perennial Respiratory Allergy*. Vasomotor rhinitis, sinusitis and bronchial asthma occurring throughout the year may be due to the ingestion of foodstuffs to which the patient is hypersensitive but is often caused by inhalant substances other than pollens, such as house and industrial dusts, feathers, animal danders, fungi, etc. It is, however, not often that a simple etiology of perennial respiratory allergy is found even after comprehensive clinical and laboratory investigations. This condition may prove a difficult and complex medical problem and its treatment a challenge to the ingenuity of the physician.[2] It is especially in such cases that the possible endogenous factors should be carefully sought. Clinical judgment is required in the assessment of the importance of the physical, infective, endocrine and psychological factors in the pattern of the patient's allergic condition. Vasomotor rhinitis and bronchial asthma of this type are best regarded not as diseases but as reaction patterns of the patient to the physical and psychological circumstances which have disturbed his previously normal life. The skilful clinician attempts to unravel the various threads of the allergic pattern and reweave them to the patient's advantage. It is obvious that an adequate allergy investigation is a time-consuming procedure and cannot be rushed in a busy practice. It is for this reason also that crowded out-patient clinics do not permit of adequate attention to the individual allergic patient, more especially if the outlook on allergy at the clinic is 'skin tests and desensitization'.

Climate merits consideration in the investigation of the physical factors that may be affecting the patient. In South Africa the effects of the combination of high temperature and high relative humidity[3] characteristic of coastal areas, more especially of the towns on the eastern shores of the Union, may precipitate respiratory symptoms in persons who are relatively free from discomfort when in inland regions. The importance of the climate factor in any patient will emerge in a carefully-taken history. In such cases of climate allergy the physician should warn the patient against visiting the coast or regions of high humidity (mist-belts). A physician at the coast may similarly, after exhaustive preliminary investigations, have to advise a sufferer to live inland.

The psychological factors in the allergic patient are of the greatest importance. The significance of emotional stress should be appraised in the analysis of the allergic pattern, and the therapeutic approach planned accordingly.

Skin Testing

Skin testing is a valuable method of confirming the etiological significance of an exogenous allergen, but it should be used to supplement and not to displace medical judgment. A positive skin-reaction in itself does not necessarily imply a clinical sensitivity. The history of the patient is the important guide.

In South Africa the pollens of grasses, Compositae and the cypress tree should be used in testing, as well as extracts of animal danders and feathers. House-dust extract should invariably be used in routine testing because it is one of the more important inhalant allergens and not often etiologically incriminated from the history.

As testing extracts lose their allergenic potency fairly rapidly, they should not be more than 2-3 months old and should be kept in the dark and cold when not in use. The patient should be warned to avoid using antihistamines or other anti-allergic drugs for at least 12 hours before the skin testing.

Skin tests are conveniently done on the volar surface

of the forearm and upper arms, but if large numbers of tests are necessary they may be done on the back. All tests should be about 1 inch apart. In the scratch test a $\frac{1}{8}$th-inch linear superficial scratch is made on the skin with the pointed end of a sterile needle or a wooden tooth-pick, and a drop of the extract is applied. For intracutaneous testing a syringe is used of 1 c.c. capacity and graduated to deliver 0·01 c.c. A needle of very fine gauge is desirable. Each test injection (0·01—0·03 c.c.) should raise a minute but definite elevation of the skin. A positive reaction appears in 5-20 minutes as a weal, generally with pseudopodia.

Constitutional and even severe local reactions need not be anticipated if scratch tests are done first. Negative and doubtful scratch tests should be repeated by the intracutaneous method. If undue reactions appear to be developing either during testing or desensitization, an injection of adrenaline, 1 : 1,000, is promptly given and repeated if necessary.

Skin testing with food extracts is not as reliable as those with inhalant substances, but they sometimes provide a diagnostic clue. No patient, however, should be deprived of a food on the basis of positive skin tests alone. Correlation with clinical findings by elimination or trial diets is desirable.

In contact-dermatitis skin-tests by injection of extracts have little value. A patch-test technique is employed in which a small portion of the moistened substance (or impregnated square of filter paper if the substance is a liquid) is applied to the cleansed skin with elastoplast for 24-48 hours (or less if irritation occurs). Erythema or vesiculation at the site of the patch confirms the patient's sensitivity to the test substance.

TREATMENT

The control of the actual attack of bronchial asthma with adrenaline, aminophyllin, ACTH or cortisone is well known and will not be discussed here. In status asthmaticus and other severe forms of bronchial asthma the latter are often life-saving and may improve the patient's condition sufficiently to permit of resumption of his usual activities and give further time to the physician to pursue his etiological investigations. Similarly the use of antihistamine drugs in nasal allergy is familiar to all. Such therapeutic agents are not of course 'cures' for respiratory allergy, but serve to overcome the initial distress of the attack. Local instillations of medicaments in the nose are not generally advisable, especially if antihistamine therapy by mouth is of benefit, except for occasional immediate, if transient, relief.

Surgical interference is advisable in allergic nasal conditions when polypi block the nostrils or where superimposed infection converts the oedema fluid of the sinuses into pus. Adequate antibiotic therapy should be given where indicated. After such necessary treatment it is important to bring the allergic condition under control lest the polypi reappear and the pus return. Whenever possible therapy on allergic lines should be attempted before operative procedures are carried out. Polypi often shrink under such treatment. Tonsils and adenoids should of course be removed when clinically indicated, but the hope for amelioration of a respiratory allergic condition should not be regarded as an indication.

An allergic disorder sometimes clears up spontaneously, but the anticipation of such a possibility is no justification for withholding allergic treatment from a patient. An allergic child may 'grow out of it'—but he may not; indeed symptoms may progressively continue or reappear in more severe form after a period of recession.

The psychotherapeutic approach is regarded by many as the rational one in the control of allergic disorders. Basically this approach is designed to relieve the patient's tensions so that he will no longer react violently to the allergens—exogenous or endogenous—which affect him. The need for specialist attention does not commonly arise except for those patients who are deeply affected psychologically. The psychology of human ailments is a study in itself and its elaboration can obviously find no place here. The physician of understanding can with patience assist sufferers on psychotherapeutic lines. Unhurried conversation during one or more sessions in an atmosphere of calm assurance should invoke in the patient a desire to expose his difficulties. He should be allowed to talk of his symptoms in his own way, guided intelligently, however, into fruitful channels. For some patients this is the first opportunity of 'getting it off their chests' and they feel the better for it. In any event emotional stresses are revealed and the patient is assisted to gain an insight into these actual or potential barriers to his recovery. He is shown how anxiety and worry restrict his outlook and channel his activities, and how they are translated into somatic symptoms. His co-operation is sought in his own cure and he will usually provide this readily and even eagerly when he appreciates the role of the emotions in his condition. Often a feeling of weary hopelessness changes to active interest with an obvious improvement in the allergic state. It may be dogmatically asserted to the sufferer that asthma, for example, does not occur in a completely relaxed person. With the physician's aid and encouragement he will learn to relax and so acquire a greater equanimity. In children the approach is more complex, since parents are involved and tact is required in resolving such domestic problems as exist.

Desensitization

Successful desensitization can be expected only if the etiologically correct inhalant factors are represented in the therapeutic extracts used, and also if other possible allergens or agents have been otherwise suitably controlled.

Desensitization with food extracts is unsatisfactory. Reliance must be placed on abstinence from the suspected food for a time; the progress of desensitization being noted by occasional diet-trials. Oral desensitization is also a lengthy procedure but is sometimes worth trying; minute amounts of the allergenic foodstuff are taken daily in gradually increasing quantity until tolerance is acquired.

In desensitization, injections may be given by the subcutaneous or by the intracutaneous route. With the intracutaneous method the possibility of severe reactions is reduced to a minimum and the plainly visible skin responses offer guidance to subsequent dosage. Pre-seasonal desensitization is recommended

for patients with pollen sensitivity. In grass pollinosis, for example, injections are commenced in June or July, before the beginning of the grass pollen season in October, when the patient should be receiving the highest strength of extract. Treatment is commenced with an intracutaneous injection of 0·05 c.c. of the weakest extract found to give a positive skin-reaction. Increase in dose is adjusted to the individual's tolerance, the aim being to produce a weal of about 1 cm. in diameter at the site of the injection. Sometimes the dose can be doubled with each injection, sometimes only a 50% increase is advisable, and often a dose may have to be repeated a number of times without increment if the required reaction is obtained. The interval between any two doses depends upon the reaction produced by the first of them. With the weaker extracts the injections may be given daily, but as the strength of extracts increases an interval of 2-3 days is advisable. If *pre-seasonal* treatment has been adequately carried out there is usually no need to carry on administration of the extracts during the pollen season. If however such *co-seasonal* treatment is thought necessary the dose should be smaller in size and given at longer intervals of time, 7-14 days. At the end of the pollen season the injections may be continued at 3-4 weekly intervals with a 'maintenance' dose of the extract. This *perennial* desensitization will serve to maintain the patient's immunity and obviate the need for recommencing pre-seasonal desensitization *ab inito*.

Prophylaxis in Allergy

Whenever possible, the attempt should be made to prevent minor allergic states developing into major allergic disorders. Early nasal or paranasal allergic complaints for example are wisely regarded as a warning of possibly more serious symptoms later. Similarly the occurrence of eczema in infancy generally indicates an allergic person who later on may develop respiratory allergy. Every effort should be made at this stage to eliminate from his diet possible allergenic foods. Mothers should be advised to watch for untoward reactions to different foods and to be hesitant in persuading their children by moral or physical disciplinary means to eat a food which is not liked. Substitute nutriment is always available. Even in the breast-fed baby the occurrence of vomiting, diarrhoea, colic and rashes may necessitate the exclusion from the mother's diet of foods to which the baby is hypersensitive.

The avoidance of allergens such as animal pets, feathers etc. in the early life of an allergic child can be undertaken by the intelligent mother on the doctor's instructions. Dustfree sleeping rooms are insisted upon and the use of sponge rubber pillows and matresses and plain washable cotton and woollen blankets is advised. No less important, in the writer's opinion, is the precaution required in this country against subjecting an allergic child to the climate of coastal regions if visits thereto are found to provoke or aggravate respiratory symptoms. The consideration and handling of the emotional factors as a prophylactic measure in allergic patients are essential.

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2. *Idem* (1950): *Ibid.*, **24**, 393.
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CONGENITAL INTRA-LOBAR SEQUESTRATION OF THE LUNG

REPORT ON FOUR CASES

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This paper deals with an unusual congenital abnormality of the lungs. Its incidence, or relative rarity, is quite unknown, since more and more of these cases are nowadays being described in the medical literature. It seems probable, now that this condition has been brought to the notice of medical practitioners, that it is being more frequently recognized, and no doubt many cases were previously misdiagnosed.

PATHOLOGY

An intra-lobar sequestration consists of a portion of lung which primarily has no direct connection with the normal bronchial tree. The bronchial elements of the cyst are well developed while the alveolae are atrophic. This sequestrum may consist of one large cyst, but more frequently is multiloculated or may be composed of a system of branching bronchi, widely dilated and filled with mucus. Secondary infection is a frequent occurrence when cysts will be filled with pus, which subsequently ruptures into the normal bronchi or is drained externally. There is an independent arterial blood supply generally arising from the lower thoracic or upper abdominal aorta, in the latter instance piercing the diaphragm and entering the cyst in the region of the inferior pulmonary ligament. The cyst itself is enveloped in the same pleural covering as the lung. The venous drainage is usually through the normally connected lower lobe and thus to the inferior pulmonary vein. At operation no plane of cleavage can be obtained between the 2 parts; this fusion is all the more complete if there has been infection in the cyst and secondary rupture into one of the bronchi of the lower lobe. Cysts are generally lined by bronchial epithelium but, in some, elements of gastro-intestinal mucous membrane have been found.

Associated lesions have been reported. There have been 2 cases of diaphragmatic hernia[16, 17] (and a further one in this series), 2 of arterio-venous aneurysm,[18] and

one in which the cyst arose from the oesophagus[19] (and a further case in this series which was associated with an intra-mural cyst of the oesophagus).

HISTORICAL

In 1946 Pryce [1] described a case, thus drawing the attention of the modern medical world to this condition. In 1947 Pryce, Holmes Sellors and Blair [2] reviewed the literature and added further cases of their own. At that time 5 cases had been reported from America, and they added 8 of their own. There were references to 3 other possible cases, but these were not authenticated. However there were many other reports of abnormal arteries to the lung without the broncho-pulmonary abnormality. It is possible, though, that suppuration in the sequestrated portion masked its true nature, and that some of the cases of abnormal arteries reported might indeed have been cases of dual abnormality.

It is interesting to note that nearly 2 centuries ago[11] and again on several occasions in the last century[12] reports were made of this arterial abnormality.

Apart from the interesting embryological theories advanced by various authors to account for this condition it is of great interest as a diagnostic problem; it is of even greater importance to the surgeon, who may unwittingly cut such an abnormal vessel with fatal results. In fact, 3 such deaths have been reported.[13, 14, 15]

EMBRYOLOGY

Various theories have been put forward. The one which holds current favour is that the developing lung bud, growing into the capillary plexus around the foregut (the primitive splanchnic plexus), obtains for itself a blood supply from the primitive dorsal aortae rather than from the ventral aorta. With further growth of the embryo (from the 10-14 mm. stage), this lung bud becomes 'captured' by its blood supply and grows independently, detaching itself from the normally connected broncho-pulmonary system. There remains, however, a close anatomical connection, and venous drainage from this sequestrated segment is generally *via* the adjacent inferior pulmonary vein. There is produced, therefore, an arterio-venous shunt which in itself might be responsible for left ventricular strain. However, venous drainage, to the azygos system of veins or to the inferior vena cava has been described. There may, however, be an abnormal blood supply without detachment, or there may be detachment and death of the part or—if it occurs early in development—of the whole lung. An extra-lobar sequestration also occurs, and may be found between the lung and diaphragm or in the abdomen obtaining its blood supply from the aorta direct or from one of its larger branches.

Associated lesions of the oesophagus or diaphragm may be present.

Pulmonary sequestration may be complete or partial; in 1905 Beneke[3] described a case of sequestration of both lungs where the bifurcation was dislocated from the larynx and joined to the lower end of the oesophagus. Kessel and Smith[4] recently described just such a case, seen at the Transvaal Memorial Hospital for Children in Johannesburg. A complete sequestration of this kind would occur at the 3-5 mm. stage of embryonic growth, whereas the present cases of intra-lobar sequestration occurred at the 10-14 mm. stage. Lower accessory lung (extra-lobar sequestration) occurs at a later stage. Complete agenesis of a lobe or of the whole lung is considered to have an analagous causative factor.

Pryce [1] has also pointed out that these abnormal arteries (which are relatively large, often being several mm. in diameter) are structurally not like bronchial arteries, which are muscular, but resemble more closely pulmonary arteries with their characteristic elastic structure. As a result of the higher blood pressure in these arteries, arterio-sclerotic changes are often shown early. Amongst the earlier reported cases the commonest situation of the broncho-pulmonary mass was in the left chest posteriorly, just above the diaphragm. Its arterial blood arises from the aorta in this region, or, commonly, within the abdomen, and piercing the diaphragm ascends in the inferior pulmonary ligament.

In 1951 Gans *et al.*[5] writing from Chicago reported one case of an anomalous lobe of the lung arising from the oesophagus. This was situated at the left apex and comprised the normal left lung. Its blood supply was from 2 vessels arising from the left pulmonary artery.

Other cases of broncho-pulmonary communication lined with oesophageal or gastric mucous membrane have been described.[6, 7] Fry *et al.*[8] consider that this latter evidence supports their theory, *viz.* that these cysts are primarily derived from budding from the oesophagus to which a systemic artery provides nourishment. Their contention is that, just as the trachea separates off from the primitive foregut by 2 longitudinal folds growing inwards, so these cysts develop from the caudal end of the *anlage* of the trachea. One of the cases to be presented had both a sequestrated lung cyst and an intra-mural cyst of the oesophagus joined together by a thick stalk of fibrous tissue, a fact which adds weight to this embryological theory.

INCIDENCE

Pryce *et al.*[2] in their first series of cases encountered sequestrated cysts in 8 out of 336 pulmonary resections. Bruwer *et al.*[10] in 1954 reviewed the recent world literature and found 79 surgical cases reported. A previous review by the same authors in 1950 [9] had disclosed 39 cases. Thus, in 5 years 40 cases had been reported from the surgical clinics of the world. The distribution of these cysts in 91 cases (including autopsy cases) is 30 on the right side of the chest, 38 on the left and 23 unspecified. The reported sex ratio is 2 males to 1 female. The highest age incidence is generally in the late teens or early adult life.

SYMPTOMS, RADIOLOGY AND TREATMENT

Symptoms are probably absent until infection supervenes, when the symptoms of an empyema, lung abscess, bronchiectasis, or recurrent pneumonitis appear.

Screening will show an opacity, or an air-containing

cyst, perhaps with a fluid level situated paravertebrally in the costo-phrenic sinus. It must be realized that this condition may occur anywhere in the chest. A bronchogram will show a space-occupying mass displacing and perhaps replacing the normal bronchi. There may be associated bronchiectasis of the normally-connected lobe, or some of the opaque medium may have been able to gain access to the cyst itself. However, because of the gelatinous nature of the mucus in the cysts their complete filling is seldom obtained, and all that the examiner sees on the bronchogram is a series of opaque globules within the mass. Barium swallow should always be undertaken to demonstrate any oesophageal abnormality or hiatus hernia.

Surgical excision is the only treatment.

Case 1.

Miss C.W.M., aged 20 years, was admitted to hospital on 3 September 1950. She had been quite well until she developed whooping cough at the age of 8 years, from which she did not recover completely, but was left with a dry unproductive cough for a year. This cough became productive of thin, whitish sputum, which persisted and after some years became offensive. At the age of 14 there was a sudden change with increase in the sputum, which became thicker and yellowish-green, with winter exacerbations. There was no haemoptysis, difficulty in swallowing, dyspnoea, loss of weight, sinusitis or other disability, and on examination she appeared to be a healthy, well-nourished girl; but coarse post-tussive crepitations were heard at the left base. On postural percussion drainage a large quantity of thick sputum was obtained from the left side.

Fig. 1. Case 1. 'Honeycombing' of the left ower lobe shown on the P.A. film.

Fig. 2. Case 1. P.A. bronchogram shows saccular bronchiectasis of the left lower lobe.

Straight X-ray showed a 'honeycombing' at the left cardio-phrenic angle (Fig. 1), which in the lateral view appeared to be in the left lower lobe. There was some pleural reaction on the diaphragmatic aspect of the left oblique fissure. Bilateral bronchogram showed all the bronchi normal, except for saccular bronchiectasis of the basal segments of the left lower lobe. (Figs. 2, 3 and 4). No oesophagoscopy or barium meal was done.

On bronchoscopy the only abnormality seen was a large quantity of pus in all the tertiary bronchi of the left lower lobe. Chemotherapy and postural drainage were instituted pre-operatively.

Left lower lobectomy was performed on 13 September 1950 through a postero-lateral thoracotomy with removal of the 6th rib. The pleura was found to be obliterated by adhesions. The entire basal segments of the lower lobe appeared to consist of multiple abscesses. A dissection lower lobectomy was performed, using No. 2 Deknatal for ligation of vessels and interrupted No. 1 Deknatal for the bronchus. There appeared to be more bleeding than usual from the lower lobe, which was still attached along the inferior pulmonary ligament. Dissection here revealed several abnormalities: (1) A large pulsating artery of several mm. diameter was seen to emerge through the diaphragm and enter the lower portion of the lower lobe. This was isolated, ligated and severed. (2) It was found that the cystic area of the lower lobe was attached to the oesophagus just above the diaphragm by a bridge of tough fibrous tissue about 2 cm. thick, and this was expanded at the oesophageal end. On severing this from the oesophagus, the expanded distal end was found in fact to be a cyst, containing mucus. It did not communicate with the lumen of the oesophagus but was partly embedded in its wall. (3) There was a para-oesophageal hernia with some portion of the stomach in the chest. This was repaired, and the chest was closed with underwater intercostal drainage. The patient made an uneventful recovery.

On cutting across the removed lobe it was seen that the lower

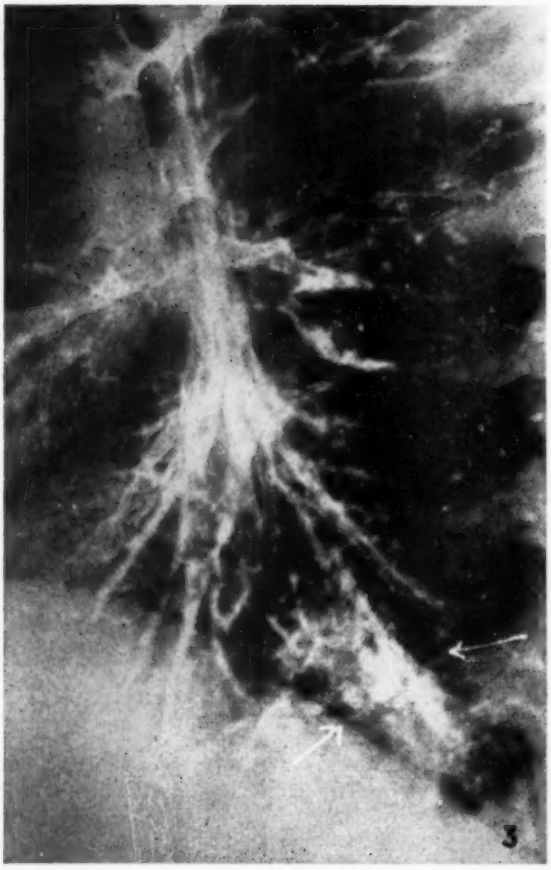

Fig. 3. Case 1. Left lateral bronchogram shows that the bronchiectasis is mainly in the posterior basic segment.

portion was made up of a multiloculated cyst containing thick muco-purulent material and communicating with only one basal bronchus. The aberrant artery was seen to ramify through the walls of this cyst. There was no independent venous drainage, the drainage presumably being *via* the inferior pulmonary vein. Section of the mucosa of the cysts showed it to be composed of bronchial mucous membrane. Unfortunately there is no record of the histology of the mucous membrane lining the 'oesophageal' cyst. The cyst had ruptured into a basal bronchus and produced a secondary brochiectasis. The cyst itself was not outlined on the bronchogram, although fragmentation of lipiodol suggests the presence of fluid (Fig. 4).

Case 2.

Mr. J.M.B., aged 17 years, was admitted to hospital on 1 September 1950. The history was that of cough for one year, which started with an episode of raised temperature and a dry cough. The cough later became productive of white sputum, which a month later was tinged with blood and remained like that for about 6 months. In March 1950 he had suffered a large haemoptysis. X-ray (14 September) showed a lobulated opacity behind the heart shadow in the region of the posterior basic segment of the left lower lobe (Fig. 5 and 6). This contained minute flecks suggestive of lipiodol fragments. Bronchoscopy (2 October) revealed a normal left bronchial tree except that the left posterior basic branch could not be seen. Bronchial adenoma was suspected and thoracotomy advised.

Left lower lobectomy was performed on 10 October. Apart from a cystic mass attached to the postero-inferior aspect of the left lower lobe and inseparable from it, there was a large aberrant artery coming through the diaphragm and entering the cyst. This vessel, running up in the inferior pulmonary ligament, was the size of a normal adult renal artery. No corresponding vein was encountered. It was not established whether this vessel communicated with either the pulmonary or bronchial arteries. On opening, the cyst was found to contain greenish mucoid material. This was submitted for analysis and no hydrochloric acid, bilirubin or pepsin was found. Section showed the presence of a cyst lined mainly by fibrous connective tissue and in parts by layers of flattened epithelial cells.

Case 3

Mrs. I. L., aged 35 years, was admitted to hospital in July 1951. She stated that at the age of 12 she had suffered an acute attack of appendicitis and about 10 days later her tonsils and adenoids had been removed for post-operative cough. She spent about 5 months in hospital and convalescent home. For a further 10 years she was well, but a productive cough persisted. In 1943 a bronchogram showed bronchiectasis of the left lower lobe. Since that date she had been relatively well, but with increasing dyspnoea on exertion. A few months before admission she had 'virus flu', followed by an increasingly productive cough with blood-streaking of the sputum.

On examination her condition was found to be good; weight 118 lbs. Persistent coarse rales were heard over the whole of the left lower lobe posteriorly, and postural percussion drainage produced large amounts of watery phlegm in which purulent nummular sputum was admixed. Straight X-ray showed mottled opacities at the left base, mainly behind the cardiac shadow. A bilateral bronchogram showed poor filling of the basal segments of the left lower lobe but with evidence of bronchiectatic dilatation (Fig. 7). Intensive pre-operative chemotherapy, postural percussion drainage and breathing exercises were instituted. Bronchoscopy showed only pus in the basal bronchi of the left lower lobe.

Left lower lobectomy was performed on 23 August 1951. The

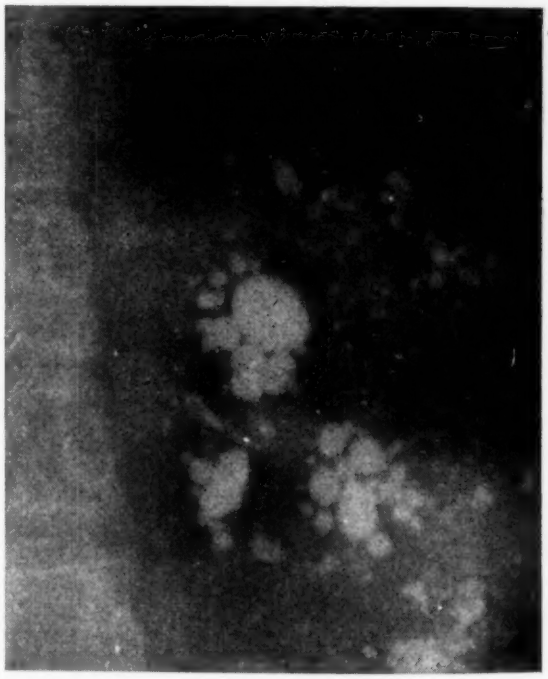

Fig. 4. Case 1. Droplets of lipiodol are shown beyond the bronchi in the sequestrated lobe.

left lower lobe was firmly adherent over the basal segments, but the anterior basic and apical segments were relatively free. Large numbers of enlarged glands were present in the inferior pulmonary ligament and around the bronchus. An aberrant artery the size of those previously encountered came up through the diaphragm into the mass of the left lower lobe. This vessel was ligated and divided. Dissection lobectomy was performed, and there was an uneventful recovery. The gross section of the lung showed a cystic area inseparable from the lobe, almost completely filled with mucus. This cyst communicated with the posterior basic bronchus. Microscopic section showed the cyst wall to be lined with bronchial epithelium.

Case 4

Mr. C.R., aged 22 years, was admitted to hospital on 17 September 1951 complaining of pain in the left chest with dyspnoea on exertion. In 1947 he had a drainage with rib resection (9th rib) of a 'left basal empyema', about 4 weeks after an attack of pneumonia. This drained for 3 months. Since then he had had almost monthly attacks of malaise with fever, for which he had to spend a day or two in bed. Recently there had been a slight constant ache below the left nipple and through to the back. There was no cough.

Examination revealed a healthy well-built young adult. The chest showed diminished movement of the left base with increased dullness up to the level of the 7th rib posteriorly extending around to the front. No adventitious sounds were heard. X-ray showed a large fluid opacity occupying most of the lower third of the left chest and extending up to the 7th rib posteriorly. This opacity had a dense convex upper limit with a small air-space with a fluid level (Fig. 8.) On the lateral view the density was seen to be mainly postero-lateral, but a small fluid level was seen in the anterior part of the left chest just above the diaphragm. No previous aspiration had been done. Bronchogram showed no bronchiectasis

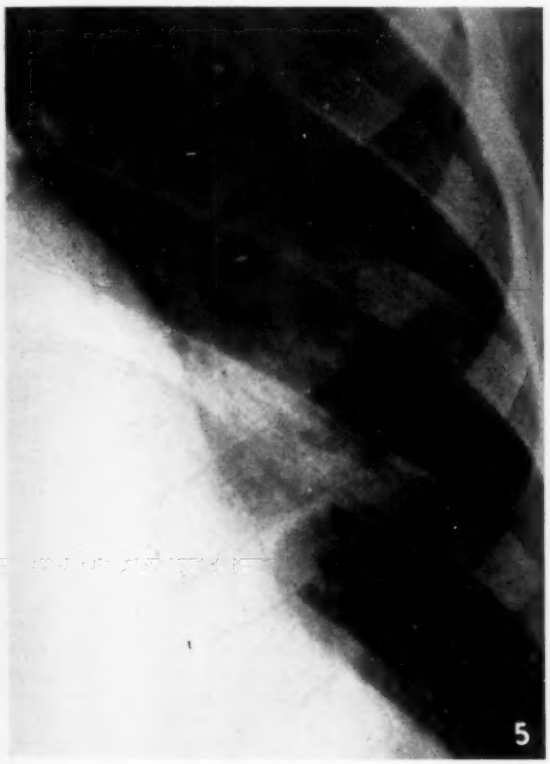

Fig. 5. Case 2. Radiograph shows an opacity at the left cardio-phrenic angle.

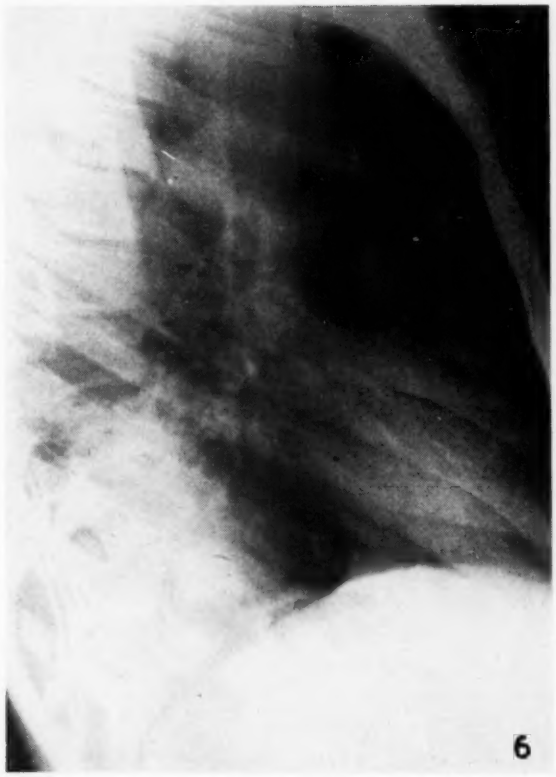

Fig. 6. Case 2. Left lateral shows the opacity in the posterior basal segment of the left lower lobe.

but the basal segments of the left lower lobe were somewhat crowded and displaced upwards and forwards.

Aspiration of 400 cc. of thick greenish fluid with a large amount of mucus was undertaken (19 September). The fluid was not offensive and did not resemble pus. On the strength of this a diagnosis of congenital sequestrated lung-cyst was made. Subsequent X-rays showed the cyst still filled with fluid in spite of the recent aspirations. Bronchoscopy was normal.

Left lower lobectomy was performed on 20 September 1951. The entire pleural cavity was obliterated by adhesions, but on separating the lung from the chest wall it soon became obious that the cyst was of enormous size and inseparable from the lung, though readily separable from the chest wall. However, at the site of the previous drainage the cyst was very adherent and was inadvertently opened; 700 cc. of thick muco-pus was aspirated. From previous experience of 3 similar cases, the presence of an aberrant artery was suspected and one was indeed found. It was larger than in the previous cases, and arose from the thoracic aorta just proximal to the diaphragm, with a large amount of dense adventitious tissue surrounding it. A dissection lobectomy was performed in the usual way. However, the inferior pulmonary vein was enormous and was in 2 divisions, the lower portion apparently draining the cystic area. After operation the patient developed a clotted haemothorax and atelectasis, which necessitated subsequent clearance and decortication, from which recovery was uneventful.

SUMMARY

Four cases of sequestrated lung cyst, all occurring at the left base, are described.

I am indebted to Mr. David Adler for permission to include the first 2 cases, which were operated upon by him.

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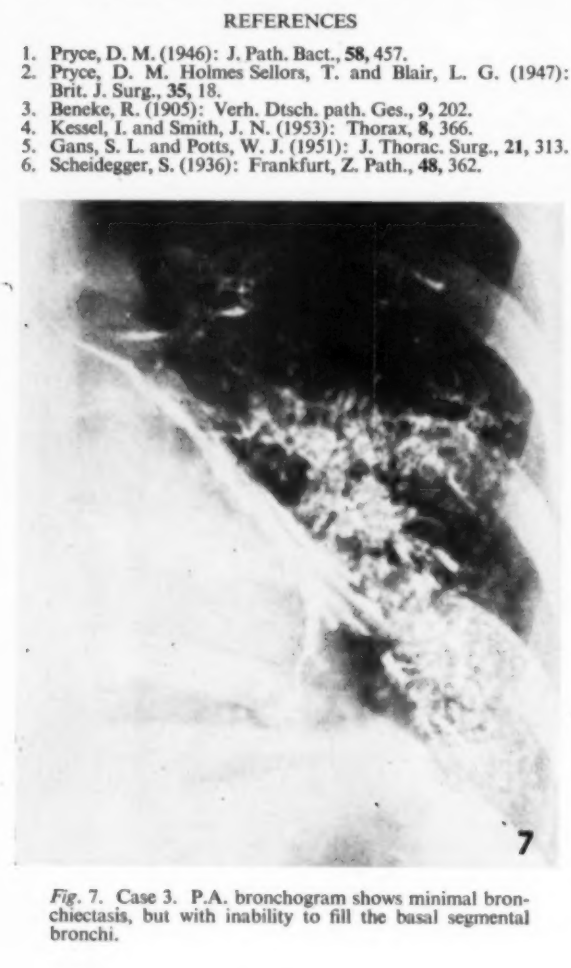

Fig. 7. Case 3. P.A. bronchogram shows minimal bronchiectasis, but with inability to fill the basal segmental bronchi.

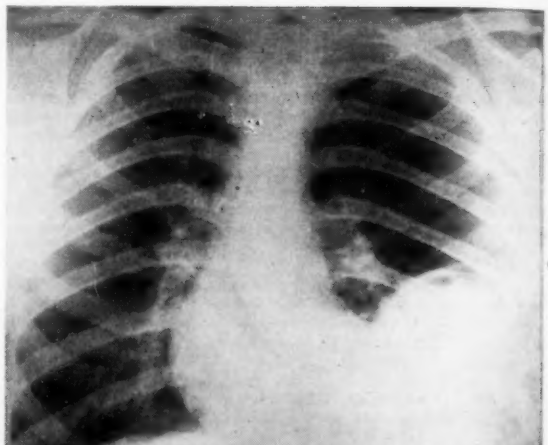

Fig. 8. Case 4. P.A. radiograph showing the left basal opacity with a small fluid-level.

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A MASS MINIATURE X-RAY AND TUBERCULIN SURVEY IN THE ORANGE FREE STATE AND NORTHERN CAPE

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The importance of the study of tuberculosis in rural areas of South Africa is shown by previous surveys done by this unit in the Native territories of the Northern Transvaal and Bechuanaland, where high prevalence rates have been found by Schneider[1] and Schechter[2] respectively. The present survey was directed to parts of the Orange Free State and Northern Cape.

MATERIAL AND METHODS

Samples were taken of the general population, of school children and (where applicable) of industrial groups, in the city of Bloemfontein, the country towns of Bethlehem, Postmasburg and Griquatown, and the Native reserves of Thaba 'Nchu, Witsieshoek, Taung and Kuruman. The majority of the populations sampled were Native (Bantu), the Coloured people were done wherever possible, and occasional European groups were X-rayed.

Work commenced in late November 1953 and was completed by early March 1954. The total number of miniature X-ray films examined was 19,886, and tuberculin tests made, 7,289.

The staff consisted of a medical officer, radiographer, clerk, driver and Native labourer. A health inspector of the staff of the Deputy Chief Health Officer, Bloemfontein, was attached to the unit for assistance in the Mantoux tests. The survey was planned in conjunction with the Deputy Chief Health Officer, Bloemfontein, whose offices were used as a base for the unit.

The petrol-driven mobile van carries a 200 milli-ampère X-ray set, powered by a 20-kilowatt generator housed in an attached trailer. The van comprises a dark-room, storage space and facilities for reading the film. A 70-mm. miniature film was used, taken on a spool on a photo-fluoroscopic principle. The unit was operated at an average rate of 100 individuals an hour with 600 as a daily average.

Local authorities were informed by a circular of the date of arrival. They were requested to inform the non-European population of the nature of the survey and to request their cooperation. This preliminary propaganda was an important factor in securing voluntary presentation for X-ray examination. With the exception of schools and certain industrial groups, samples of the general population were not selected. The size of sample varied from 500 to 2,000 in each locality. Children below 5 years of age were not X-rayed because of technical difficulties.

A good sample requires that the objects be chosen at random from a larger group in order to possess the characteristics of that group. The sample should also not be unreasonably small. Every individual of the population must stand an equal chance of being included. This can be done by drawing lots or by the use of special selection tables. Neither of these methods is possible in a survey of this nature.

The evaluation of the samples based on voluntary presentation was attempted. Samples were broken down into age and sex groups and each was expressed as a percentage of the whole sample. Histograms of each sample were made and they will at a later date be further analysed. They do, however, all resemble the total sample histogram illustrated here with a few deviations from the typical pattern caused by smallness of sample and certain local conditions encountered at the time of X-ray; for example, poor general response, rain interfering with work.

Fig. 1 shows a histogram for the total samples of the survey of the Native population based on voluntary presentation of individuals. Excluded are selected groups such as industries and schools. Fig. 2 shows the corresponding histogram for the Coloured population. Except for a comparatively small group of Bloemfontein individuals in eacn (703 Natives, 944 Coloureds), the picture is essentially a rural one. Fig. 3 shows a comparable histogram of the whole Native population of South Africa, based on the 1936 census figures.

Our samples reflect the normal pattern of a population in that in each age-group both sexes are smaller than the one preceding it and larger than the following one. They show a higher frequency of the younger age-groups as compared with the census histogram. This is in keeping with census findings in rural areas as analysed by Sonnabend[3] and shown on the following table:

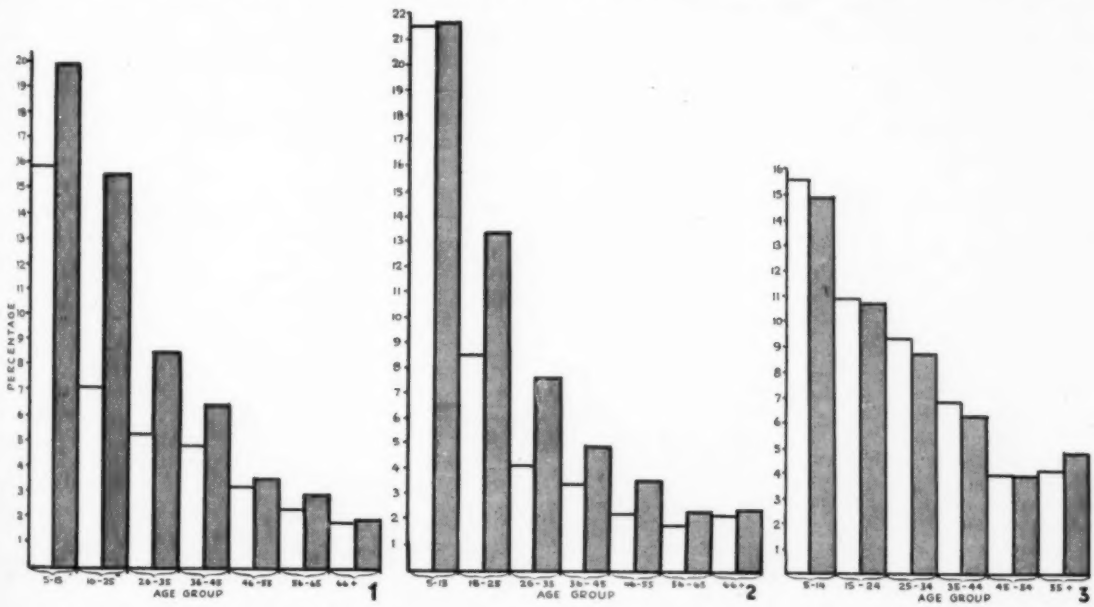

Fig. 1. Histogram of all Natives (O.F.S. and Northern Cape) voluntarily presenting for X-ray, showing age and sex distribution. Total 9,530. White columns = males, shaded columns = females.
Fig. 2. Corresponding histogram for Coloureds. Total 2,349
Fig. 3. Comparable histogram of the whole Native population of South Africa based on 1936 census (age-group 0-4 omitted).

PROPORTIONS PER CENT (NATIVES)

Age-group	*Urban*	*Rural*	*Union*
0–5 (Pre-school)	6·97	16·01	14·44
6–15 (School)	14·43	31·06	28·18
16–59 (Working)	74·21	44·63	49·75
60 plus	4·39	8·30	7·63

A further comparative finding is a higher frequency of females than males in each age-group. This is also a characteristic of Native rural life. In the analysis referred to above, Sonnabend finds the Native tertiary masculinity rate (number of males to 100 females in general population) to be 218·2 in towns and 86·4 in rural areas of South Africa. Our Native total sample, essentially a rural one, gave a value of 69·2.

The conclusion drawn is that our sample material obtained on a voluntary basis from the Native general population has a randomness for age and sex distribution in keeping with the true demographic state. As certain age and sex groups are at greater risk for tuberculosis, it is important that a sample should not have a preponderance of any age-group. An inclusion of more school children than is normal for that area in a sample would lower the reading from the true value, as the age-group 5-15 years, the 'golden age of tuberculosis', is recognized as having a low incidence of tuberculosis of clinical significance.

Samples obtained by the above voluntary method ensure that the individuals represent a wide area of the locality. This method must approach closer to the true prevalence rate of tuberculosis than the method of attempting to X-ray all in a selected area. Tuberculosis does not spread itself evenly over an area, but tends to pocket, with areas of high prevalence. This has been shown to be true on all geographical scales—from the national down to the Native location of the small town. The latter information is based on the writer's personal experience at a Health Centre. Workers in the United States of America have referred to the wide variation in the incidence of tuberculosis in the different states.

MASS RADIOGRAPHY

Mass miniature radiography with the 35-mm. film, when originally introduced, was intended to act as a screening method. All abnormal films are recalled for a large film and clinical assessment. In the present survey diagnosis was made on the basis of the miniature reading. Previous surveys made by units of this hospital have shown the system of recalling individuals for large-film X-ray to be impractical when dealing with Natives in rural areas. Very few will visit the van a second time. Repeat X-rays and clinical assessment would limit the extent of the survey because of the additional time needed. Large-plate X-ray photography and processing in the van is a comparatively slow procedure on account of the limited dark-room space.

The medical diagnosis of an individual case is generally based on multiple factors and the case is usually seen more than once. This of course reduces the chance of error in diagnosis. When the single-observation method of diagnosis has to be used for establishing an epidemiological index, the individuals do not need to be identified. This enhances the value of the index as false positives are to a certain extent corrected by false negatives.

The suitability of the 70-mm. film for tuberculosis case-finding on survey has to be considered.

The quality of the film is such, that with experience in its reading it is considered of equal value to large plates in selecting cases with typical tuberculous opacities, and little inferior to the large plate in doubtful cases. This view is supported by Birkelo[4] and others acting as a board of roentgenology, appointed by the Administrator of Veterans' Affairs in the United States of America to study the effectiveness for tuberculosis case-finding of various X-ray and photofluorographic methods. A 35-mm. photofluorogram, a 4-inch by 10-inch stereophotofluorogram, a 14-inch by 17-inch paper negative and a 14-inch by 17-inch celluloid film (equivalent to our large plate) were taken within a few minutes of one another on each of 1,256 persons. The 4 sets of films were interpreted independently by 2 radiologists and 3 chest specialists. The material was analysed in considerable detail as to variation resulting from the limitations of the various methods as well as from the subjective errors inherent in film interpretation. The results of the analysis justify the conclusion that, except for a slight disadvantage to the miniature technique resulting from over-reading, not one of the methods—not even the 14 by 17-inch celluloid—is superior for case-finding purposes to any of the other methods. The amount of over-reading of miniature films was found to be slight and could be traced to only one reader for each of the miniature techniques. This slight handicap can apparently be overcome by personal training.

Only miniature films with a typical appearance of the re-infection (adult) type of tuberculosis and the progressive primary type were used in the determination of prevalence rates. The following factors were guides in this selection:

Sites of Opacities

Apical and upper-zone involvement, particularly the right upper zone, is typical of tuberculosis. Particularly characteristic is the combined involvement of one upper zone and the opposite mid-zone—the latter caused by bronchogenic spread from the former site. Involvement of the lower zones alone is uncommon in tubercle and such opacities were not used in the estimations. Homogeneous densities confined to the hilar regions in children and adolescents are typical of primary tuberculous infection and not progressive. These were not included in calculating the epidemiological index of tuberculosis. Films read as progressive primary tuberculosis showed a more extensive involvement and the uneven mottling of tuberculosis.

Character of Opacities

An uneven density is characteristic of tubercle as mottling or granular densities on miniature film. An element of softness of density as a background is usually present and denotes activity. Cavitation, typical of tuberculosis as an association of these densities, is distinguished from lung abscess by the usually thicker wall

of the latter with its fluid lever, predilection for the right middle and lower zones and the halo-like homogeneous surrounding densities rather than the uneven mottling of tuberculosis.

X-ray evidence of healed tuberculosis was excluded in calculating the index. These films have a fibroid and harder appearance, with evidence of calcification and chronicity as evidenced by contractures, e.g. trachea deviated to the affected side, shrinkage of affected upper zones.

Only two cases of pleurisy were found; they were included in the prevalence-rate calculation. Healed pleurisy, as evidenced by thickened pleura having a clearer limitation mark of the opacity and often some contracture of the thoracic cage on the affected side, was not included.

The age of the individual was an important factor in the reading of the film. Individual reports were made to the local authorities on all abnormal X-rays.

X-ray Findings

Table I summarizes the findings. Highest prevalence-rates are noted in the Native reserves of the Northern Cape. Bloemfontein has a lower rate than the country-town locations. The trend of increasing prevalence as the survey moves from the city to the Native reserves is opposite to the trend found by Dormer *et al.*[5] in Natal in 1943, viz. an increasing prevalence as surveys moved from tribal areas (0·25%), to mission reserves (0·75%), and peri-urban (1·5%) and urban areas (2%).

Higher prevalence rates for Coloured than Natives in the same area generally are noted.

TABLE I. RESULTS OF MASS X-RAY

	No. X-rayed	Percentage of Active Pulmonary Tuberculosis*
Bloemfontein		
Batho Native Location (G.P.) ..	703	0·42
Heatherdale Coloured Location (G.P.)	994	0·74
Bloemfontein Industries:		
Natives	2,153	0·46
Europeans	1,177 (1 case)	0·09
Thaba 'Nchu District		
Natives:		
Reserve Locations (G.P.) ..	895 (5 cases)	
Private Farms (G.P.) ..	500 (1 case)	
Tweespruit Town	628 (1 case)	
Total Natives	2,048	0·34
Coloureds	357	0·88
Bethlehem Location		
Natives (G.P.)	1,755	0·45
Coloureds (G.P.)	42 (1 case)	
Witsieshoek Native Location		
Natives (G.P.)	1,215	0·74
Taung		
Schools (4)	1,999 (1 case)	0·07
General Population	422 (10 cases)	2·61
Kuruman		
Natives: Bahtlaros Reserve and Town Location (G.P.)	1,890	1·11
Coloureds: Town Location (G.P.) ..	266	1·12
Postmasburg Location		
Natives (G.P.)	1,337	0·74
Coloureds (G.P.)	1,337	0·74
Coloureds (G.P.)	422	1·6
Griquatown		
Natives (G.P.)	360	0·27
Coloureds (G.P.)	552	0·38
Europeans:		
Adults	44	0
School Children (Sub A to Std. 10)	342	0

*i.e. reinfection type and progressive pulmonary tuberculosis
G.P. = general population.

An interesting finding at Postmasburg was 9 homogeneous cyst-like opacities. In spite of negative Casoni tests in 4 who could be traced, hydatid disease is offered as the probable diagnosis. The individuals involved were 8 Natives and 1 Coloured. This is a sheep-farming area. A prevalence rate of 0·45% hydatid disease of the lung was calculated. Kuruman had 2 such cases out of a total of 2,156 sampled. Other findings in the total 19,886 X-rayed were: congenital cystic disease of the lungs—5, mitral-stenosis cardiac silhouettes—3, dextra cardia—4 (3 in Taung, 2 being in the same school).

TUBERCULIN TESTING

Mantoux tests were done wherever practical and concurrently with radiography. The technique used is standardized by the World Health Organisation Research Office. Purified protein derivative (PPD) is used in an intradermal injection of 0·1 c.c. = ·0002 mg. of PPD = 10 Tuberculin Units (TU), which is made at the junction of the middle and upper thirds of the forearm on its volar aspect. A wheal of 7-mm. is used as a guide to the 0·1 c.c. infiltrated, rather than the syringe reading, on account of leakage. The transverse diameter of the induration is measured 72 hours later and recorded.

A total of 7,928 tests were done. The number of the persons injected who came back for reading was 4,773 (Natives 3,822, Coloured 951). Wastage was high. The following groups were done (readings only):

Bloemfontein location, general population, 497 Natives.

Bloemfontein location, general population, 686 Coloured.

Bloemfontein industries, 1,175 Natives.

Taung and Kuruman schools, 1,042 Natives.

Postmasburg and Griquatown schools, 707 Natives and Coloured.

The following tuberculin patterns were found. The histogram in Fig. 4 shows the frequency distribution of the transverse diameter of Mantoux reactions in 2,651 children and adolescents aged 5-19 years from the above schools and those of school age. Similar studies have been made in Denmark, Egypt, Mexico and India and reviewed by Edwards and Palmer.[6] Their histograms, which are reproduced in their article,[6] and also in Schneider's,[1] show a tendency to two groupings of tuberculin sensitivity in each. The 6-mm. mark on the horizontal coordinate (size of Mantoux reading) separates the percentage frequencies (vertical ordinates) into a left-hand low-sensitivity group and a right-hand high-sensitivity group. The frequencies of the low-sensitivity group commence with the highest percentages and decrease to the 6-mm. mark. The percentage curve rises from this mark to form the high-sensitivity group to resemble a normal bell-shaped curve. Edwards and Palmer consider the high-sensitivity section of the histogram to represent the specific tuberculous allergy and the low-sensitivity

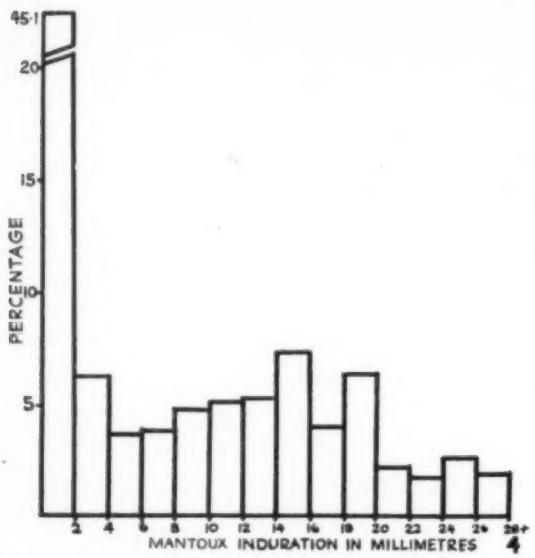

Fig. 4. Histogram of frequency distribution of transverse diameters of Mantoux readings in 2,651 individuals of ages 5-19 years in O.F.S. and Northern Cape schools. Total 2,651.

section to denote a non-specific unknown allergy. The latter allergy is thought to be related to geographical factors (it is more common in the rural areas surveyed) and to be influenced by altitude. The possibility exists that an organism antigenically related to *Mycobacterium tuberculosis* may be responsible for this low-grade sensitivity. This work has opened new fields in tuberculin research and has called for reconsideration of the definition of a positive Mantoux. According to these findings, reactions greater than 6-mm. should be regarded as positive. Other values may pertain in certain countries or areas with a different tuberculin pattern; e.g. India, where the abovementioned typical dual distribution of sensitivities is not shown.

The histogram of our survey total does show this dual

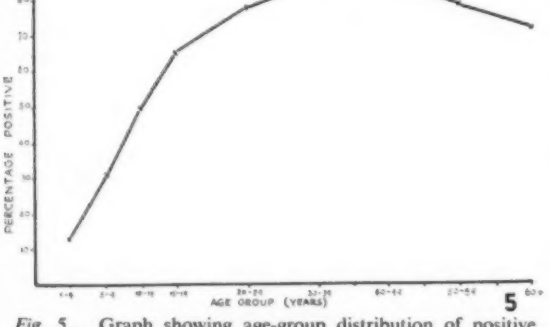

Fig. 5. Graph showing age-group distribution of positive Mantoux (10 T.U.) in total surgey of 4,773 individuals in O.F.S. and Northern Cape.

distribution and resembles closely that of Mexico with 6 mm. as the dividing point of the two sensitivity groups. Accordingly values of 6 mm. and greater were read as positive and forms the basis of Fig. 5, which shows in graph form the percentage positive of age-groups of the total survey. The curve rises sharply from 13·42% positive in the 1-4 year group to 65·66 at 15-19 years. Thereafter there is a slight flattening of the curve with a peak at 86·35% in the 40-49 year group. There is a drop in the curve after the age of 50. This decrease in sensitivity after the age of 50 was observed by Myren in 1950 among rural Norwegians. Borgen, Meyer, and Refsum found a similar decline after 50 in Oslo adults, using the Pirquet test.

Table II shows comparative age-group tuberculin-positive values expressed as percentages. In the city, country-town and Native-reserve areas surveyed, there is no significant difference in the degree of tuberculinization of non-Europeans of these younger age-groups,

TABLE II. RESULTS OF TUBERCULIN TESTING (YOUNGER AGE-GROUP)

Age-group	*City*		*Town Location*		*Natives Reserves*	
	Bloemfontein (Native and Coloured)		*Bethlehem, Postmasburg, Griquatown*		*Taung, Kuruman*	
	No.	*% Pos.*	*No.*	*% Pos.*	*No.*	*% Pos.*
1– 4	158	13·29	73	13·69	—	—
5– 9	283	32·50	356	35·11	213	30·04
10–14	242	49·17	513	51·66	610	48·03
15–19	104	71·15	136	63·97	219	63·49

where any difference would have been reflected. The older age-groups tend to show this similarity as well but the smallness of samples do not warrant publication. For this reason separate figures for the Coloured are not given, but a perusal of the analysis suggests the same pattern.

The even and high degree of tuberculin-sensitivity in city and rural area of the survey contrasts with the generally higher prevalence rate of tuberculosis morbidity in the rural areas. It is clear that other factors besides simple infection are required to cause clinical tuberculosis. The migrant Native labourer from the rural area prefers to return home when clinical tuberculosis becomes apparent in him in the city. With increasing industrialization this must be an important factor in causing and maintaining high infection and morbidity rates in rural areas.

Roemer [7] has drawn attention in the USA to the fact that the decline in the tuberculosis mortality rate has proceeded at a greater rate in the cities than in the rural areas. With the improvement in case finding and general epidemiological control he expects the urban mortality rate, at present higher than the rural, to fall below the latter rate shortly. He considers the following factors operative in this connection:

1. *Handicaps* in control of tuberculosis because of low *per capita* income, low population density, and deficiencies of medical personnel and general medical facilities.

2. *Rural Poverty*. Despite unprecendented farm prosperity income levels and standard of living in rural areas of the USA are lower than the urban.

3. *Educational*. Rural standards of education, and this includes instruction in personal hygiene and living habits, are well below the urban.

4. *Housing*. Contrary to popular opinion the average rural house is more congested than the urban.

5. *Nutrition*. Except for periods of economic depression, urban eating habits were found to be better than rural.

6. *Labour-saving Devices*. Greater use of these is made in urban areas. The factor of stress and fatigue would appear to be an important factor in the causation of tuberculosis.

It may well be that the above factors could apply to the South African countryside.

SUMMARY

A mass miniature X-ray survey and tuberculin testing were done in the Orange Free State and the Northern Cape. The methods of sampling is described. This is on a voluntary basis of presenting for X-ray. The randomness for age and sex distribution approached the normal pattern of the population when the total sample was examined.

The city of Bloemfontein showed a lower prevalence rate for the 're-infection and the progressive primary' types of tuberculosis than the rural areas. The Native reserves of the Northern Cape showed the highest rates.

The diagnostic criteria are discussed, as also the diagnostic efficiency of the 70-mm. film.

The city and rural areas showed a similar degree of tuberculinization.

The importance of the problem of tuberculosis in rural areas has been shown by the high prevalence rates of clinical tuberculosis found by units of this hospital in the Natives reserves.

I wish to thank the Secretary for Health for permission to publish this article; Dr. B. A. Dormer for his guidance in the survey; Dr. C. H. Brink, Deputy Chief Health Officer, Bloemfontein, for his assistance and advice in the planning of the survey; Mr. J. Fleming for extracting the sampling data and preparation of histograms; and Miss M. Schofield for preparation of the diagrams for publication.

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ASSOCIATION NEWS : VERENIGINGSNUUS

THE DURBAN 'MYSTERY DISEASE'

CLINICAL MEETING OF THE NATAL COASTAL BRANCH HELD ON 17 MAY 1955 AT THE ADDINGTON HOSPITAL, DURBAN

At a clinical meeting of the Natal Coastal Branch, held on 17 May 1955 at the Addington Hospital, Durban, Dr. Pauline Klenerman was in the Chair and 60 members were present. The subject for the evening was a *Clinical Demonstration of 'Mystery Disease' Cases*, by members of the investigating team.*

Dr. R. W. S. Cheetham, in demonstrating 3 patients (cases 1, 2 and 3) stated that there were no early cases for demonstration, but certain old cases exhibited the features of both early and late phases.

Case 1. A nurse who presented, initially, with occipital headache and stiff neck of 1 day's duration; the left arm was heavy and weak. She had severe pain in the back, was unable to sit up, and had marked sweating of the hands and feet. A slight pyrexia was present and at first she was ill. Movements of the head increased the headache and the heavy feeling of the arms became progressively worse. At first no knee jerks or ankle jerks could be elicited and a diagnosis of poliomyelitis was considered, but it was ascertained that the patient had had poliomyelitis at the age of 4 years.

Salient features in the examination at the time of onset were a weak left arm, patchy diminution in sensation in the arm and leg, and difficulty in raising the right leg. On 22 February she had cramps of the left leg and on 28 February a dragging feeling in the same leg. There were no movements at the shoulder or the elbow of the left side. Rest and splints were applied, and a lumbar puncture performed, which resulted in a mild exacerbation of the headache. A few days later the weakness of the left hand increased, but she felt physically well and on 25 March was transferred to Addington Hospital. Subsequently, she experienced occasional headaches and weakness of the left arm and left leg.

On 9 April she developed diarrhoea and nausea, and on 18 April was still unable to sit up. The reflexes in the affected extremities were completely depressed, and vibration sense was impaired. She now (17 May) presents a flaccid paresis of the whole of the left arm and hand and a weakness of the left leg. Movement in the left arm is minimal, but in the left leg it is noted that there is some power during automatic learned movements, but on attempting voluntary movement against resistance the weakness appears even more marked, and contractions of the muscles are clonic-like in character and not sustained for any length of time. The reflexes in the arm are depressed and in the leg increased. Occasionally there was involuntary jerking in the arm. Noteworthy was the tendency to euphoria and the lack of appreciation of the degree of paralysis.

Case 2, a male adult. The condition occurred in the middle of January and was characterized by periodic bouts of headache and weakness. He now shows a curious clonic-like feature in that contraction of his arm against resistance results in a spread of the involuntary movements to the rest of the body, sustained for some length of time. The picture was very bizarre and almost like hysteria. This patient has (at 17 May) not been able to work since his illness.

Case 3, a nurse. Admitted early in the epidemic to Wentworth Hospital, where her lower limbs were hypertonic and the reflexes increased. She had weakness of the shoulder-girdle muscles and was considered to be a case of poliomyelitis. Initially she had severe occipital headache, nausea and a right foot-drop. Her plantar responses were flexor. No abnormal constituents were

found in the lumbar puncture. She was treated with rest and ultimately allowed to go home.

Recently she had suffered a relapse; both legs were completely paralysed and the paralysis spread to the intercostal muscles, resulting in diminution in chest expansion; she was dyspnoeic at times and required oxygen. A sensory level to touch, pain, temperature, and vibration existed up to T. 3. She had thus been ill since 17 February and, if anything, was (at 17 May) becoming progressively worse.

These cases illustrated the global nature of the condition, involving a supracortical element as evinced by the alteration in affect and extending through the central nervous system to the periphery. In some cases there was tenderness of peripheral nerves.

Mr. Cyril Kaplan demonstrated 4 patients (cases 4, 5, 6 and 7):

Case 4, a nurse aged 26 years. History a cold since 1 April 1955 and recovery by 5 April. On 8 April sore throat, lethargy, and tingling pain in the left arm which was persisting on 16 April. On 10 April right leg sore in the morning with tingling and weakness, and backache, occipital headache and nausea later in the day. On 13 April admitted to the fever hospital: stiff neck and back, unable to sit up in bed, tremulous both biceps, feet stiff, right quadriceps and hamstrings jerky, patchy anaesthesia over right legs. Patient stayed in Wentworth until 2 May and then transferred to Addington Hospital. On 2 May biceps very brisk, all reflexes present, plantar responses flexor, weakness of neck, back and leg. Patchy diminution of sensation, all mucle-groups tender. The last group to relax is the hamstring muscles. Left leg externally rotated, with foot-drop (an appliance applied).

Case 5. Admitted on 15 April with pyrexia, headache and severe diarrhoea for 3 days, and pains in the neck, right shoulder and left hip. Weakness of grasp of left hand. Unable to sleep and headache became worse later. To date (17 May) there is slight weakness of left arm and left leg, the patient is unable to sit up, and there is little progress at the moment.

Case 6, a nurse. This case was shown from the orthopaedic point of view. On 22 March the residuum of the disease was a left foot-drop. Tibialis anterior working strongly. Internal rotation of the whole foot and peroneal palsy (fitted with an iron).

Case 7. A female patient wearing a walking caliper. On 20 February diagnosed as poliomyelitis. Allowed up in the middle of April, but there was persistent tightness of the hamstrings. At present (17 May) there is weakness of the hamstrings and she is unable to control the knee.

Dr. B. Moshal then reviewed the cases. He stated: (1) The vast majority of the patients got better completely. Of the 80 to 90 nurses only 12 were left, and it was expected that nearly all would get better completely.

(2) There was a remarkable number of relapses. Some relapsed on the journey from Wentworth Hospital to Addington Hospital. There were relapses even in bed and the cases went back to the original acute stage. Relapses occurred even after convalescence.

(3) The condition appeared to be a remarkable disseminated lesion (*a*) starting in the cortex, (*b*) spreading through the central nervous system, and (*c*) passing to the peripheral nerves. Some cases appeared to be functional and hysterical. The condition looked like a disseminated encephalomyelitis. The etiology unknown; possibly a virus or a toxin?

Dr. H. L. Wallace stated that there were no children affected, and that the condition occurred towards the end of a poliomyelitis epidemic. He queried its relationship to polio and whether the condition was the functional end of a disorder with an organic beginning.

Dr. J. Straun Alexander thought that rehabilitation in relation to these cases was all-important.

Dr. J. A. Macfadyen stated that a great search for the etiology had been made and that a committee to investigate the matter had been appointed with the following personnel, (in addition to the Clinical Committee under the Chairmanship of Mr. R. C. J. Hill): Dr. J. Gear (Polio Research Foundation), Dr. G. D. English (City Health Department, Durban), Dr. J. C. Thomas and Dr. G. A. Joubert (Wentworth Laboratory) and Dr. Marloth, Government Toxicologist.

Dr. J. C. Thomas stated that the cases had been investigated and they had failed to isolate polio virus in any of the affected people.

Dr. M. Casson said that the essentials of treatment were: (1) Rest was essential; active movements and physiotherapy were contra-indicated as also was getting up too early by reason of the headache, vomiting, nausea and cramps; and (2) No strain should be imposed when the patients got up.

Dr. T. M. Adnams stated that in his opinion only 17 cases were symptom-free.

Dr. Kelman Drummond remarked that none of the cases showed any connection with polio and that the behaviour of the condition resembled a toxic allergy or antigen-antibody reaction.

Mr. R. C. J. Hill stated that the condition existed long before the nurses were affected and, as the result of intensive investigation by Dr. English, the theory of intoxication had not been proved, though not disproved.

Dr. Pauline Klenerman asked Dr. Cheetham whether one of the demonstrated patients, who almost went into clonic spasms which even the wife could stop by pressing on the upper part of the back, was not suffering from a functional disorder superimposed upon a previous organic lesion; and also whether hypnosis had been tried. *Dr. Cheetham* replied that hypnotism had been tried in this case but hypnosis was not achieved. He stressed that one of the end-symptoms of this condition was a bizarre type of behaviour which almost appeared functional yet he felt to have an underlying organic basis.

The meeting terminated at 10.30 p.m. with a vote of thanks to the investigating committee.

* This report has only now become available for publication. A memorandum on the 'mystery disease' outbreak by R. C. J. Hill, F.R.C.S., Chairman of the Clinical Section of the Investigating Committee, was published in the *Journal* of 9 April 1955 (**29**, 344). A further clinical report and a report on the virological investigations are awaited. Clinically, there have been severe relapses in some of the cases, and the disease is much more serious than was at first anticipated. The virological results have been essentially negative up to the present.

PASSING EVENTS : IN DIE VERBYGAAN

Dr. Louis Schrire, M.B., Ch.B. (Cape Town), D.O.M.S. (R.C.P. & S. Eng.), who has been practising as an ophthalmic surgeon in Kimberley for the past 6 years, has sold his practice to Dr. A. Victor, and has started an ophthalmological practice in Cape Town at 1 Hof Street (telephone 2–8327).

* * *

Dr. Monty M. Zion, M.B., B.Ch., M.R.C.P., has recently returned to South Africa from England. While overseas he worked as Cardiology Registrar at the London Chest Hospital for 15 months. In May 1955 he presented a paper on *The Post-Commissurotomy Syndrome* at the annual meeting of the British Cardiac Society. Before going to England he served on the staff of the Cardiac Clinic at the Johannesburg General Hospital for 2 years. Dr. Zion has commenced practice as a Specialist Physician at 701 Ingram's Corner, Hillbrow, Johannesburg (telephone: Rooms 44–2793, residence 45–5364).

* * *

The Annual Meeting of the Association of Physicians of South Africa will take place on Wednesday 19 October 1955, at 2.30 p.m. in Room 12, New Arts Block, Pretoria University.

* * *

Mr. B. W. Franklin Bishop, F.R.C.S., accompanied by his wife, is returning to South Africa on the *City of Port Elizabeth*, arriving in Cape Town on 3 November. Mr. Bishop has been on the staff of the Nuffield Department of Plastic Surgery, Oxford, since August 1953. He intends practising plastic and facio-maxillary surgery on his return to South Africa.

Dr. Norman Klass, M.B., D.Phys. Med., Specialist in Physical Medicine, has moved to 1008 Cavendish Chambers, Jeppe St., Johannesburg. Telephone number remains 22-8650.

Die nuwe adres van dr. Norman Klass, M.B., D.Phys. Med., spesialis in Fisiese Geneeskunde, is Cavendish Chambers 1008 Jeppe-straat, Johannesburg. Telefoonnommer bly 22-8650.

BOOK REVIEWS : BOEKRESENSIES

FRACTURES AND JOINT INJURIES

Fractures and Joint Injuries. Volume II, Fourth Edition. By Sir Reginald Watson-Jones, F.R.C.S., F.R.A.C.S. (Hon.), F.A.C.S. (Hon.), F.R.C.S.E. (Hon.), M.Ch. Orth., B.Sc., M.B., Ch.B., M.R.C.S., L.R.C.P. Pp. 1,073+viii with 1,613 illustrations. £6. Edinburgh & London: E. & S. Livingstone Ltd. 1955.

Contents: Part III Injuries of the Upper Limb. 1. Injuries of the Shoulder. 2. Injuries of the Arm. 3. Injuries of the Elbow. 4. Injuries of the Forearm. 5. Injuries of the Wrist. 6. Injuries of the Fingers and Hand. *Part IV Injuries of the Lower Limb.* 7. Injuries of the Hip. 8. Injuries of the Thigh. 9. Injuries of the Knee. 10. Injuries of the Leg. 11. Injuries of the Ankle. 12. Injuries of the Foot. *Part V Injuries of the Trunk.* 13. Facio-Maxillary Injuries. 14. Injuries of the Chest. 15. Injuries of the Pelvis. 16. Fractures and Dislocations of the Spine. 17. Fractures and Dislocations of the Spine with Paraplegia. 18. Principles of Rehabilitation after Fractures and Joint Injuries. 19. Organisation of an Accident Service. Index of Authors. Subject Index.

For the last 3 years surgeons and others throughout the English-speaking world who are interested in the treatment of injuries, have keenly awaited the second volume of the present edition of this internationally well-known book. None will be disappointed.

Both the author and the book enjoy such fame that no introductions are needed—both have gained almost every available medical 'Oscar'.

The chapter on injuries and degenerations of the rotator cuff of the shoulder has been rewritten, and particular interest attaches to the view that the author states quite unequivocally that the pathology of recurrent dislocation of the shoulder is similar to that of recurrent dislocations in other joints; namely that inadequate immobilization after the reduction of the initial dislocation leads to imperfect capsular healing and resulting weakness, and the subsequent redislocation with traumata of diminishing violence (87%). In addition there is usually present (in 82% of the cases) a compression fracture of the back of the head of the humerus. Based on this pathology a more reasonable approach is now possible in the treatment of this common, but difficult, condition and many of the 70 classical operations previously described may now be abandoned.

For us in South Africa particular interest is attached to the chapter on the rehabilitation and treatment of the paraplegic case resulting from a fracture-dislocation of the spine with cord damage, in view of the fact that there are moves afoot for the establishment of specialized centres here. How necessary these centres are may be easily understood from an appreciation of the specialized knowledge and facilities required for the treatment of these unfortunate cases.

The chapter concerned with the organization of a rehabilitation centre is of great value too, since we are to have our first centre soon. These chapters are particularly mentioned in view of the progress made in these directions in our own South African services.

The use of the intramedullary nailing in the treatment of factures of the shaft of the femur, especially in the upper third, and also its use in the treatment of ununited fractures of the humerus, is described in the present volume.

In conclusion one feels that this book materially assists in providing some of the requisites for what may almost be called the orthopaedic surgeon's *credo:* 'The patient must understand his disability; he must regain confidence and be inspired; his doubts must not become anxieties; his fears and misgivings must be dispelled; his social problems must be solved; he must be reassured; he must not fear the future'.

The book is well produced on excellent paper and the illustrations are clear and stimulating. It does great credit to the author and the publishers and we feel sure it will even exceed the success of the previous editions, if that be possible.

A.S.

MANAGEMENT OF POLIOMYELITIS

The Management of Acute Poliomyelitis. By C. P. Stott, S.R.N., C.M.B. and M. Fischer-Williams, M.R.C.P.Ed. Pp. 99+xii with 43 illustrations. 12s. 6d. Edinburgh & London: E. & S. Livingstone Ltd. 1955.

Contents: 1. The Nature of the Disease. 2. Isolation Technique. 3. The Clinical Picture. 4. Admission and Equipment. 5. Trunk and Limb Paralysis. 6. Nursing Care in Trunk and Limb Paralysis and Non-Paralytics. 7. Hot Packs. 8. Physiology of Respiration. 9. Bulbar Poliomyelitis. 10. Nursing Care in Bulbar Poliomyelitis. 11. Types of Respirator and the Principles Involved. 12. Nursing Care of Patients in Respirators. 13. Weaning a Patient out of a Respirator. 14. Bulbo-Spinal Paralysis. Appendices. Index.

It used to be said of Typhoid Fever that recovery depends upon good nursing. This adage, with reservations, applies more fitly today to poliomyelitis, in the management of which details are constantly debated. To solve just these practical problems the book under review serves an invaluable purpose.

It is written for 'nurses and doctors' (in that order); hence, at a glance, it smacks mildly of first-aid manuals. This is noticeable particularly in the lay-out (which, in synopsis form, is suitable for quick reading) and in the rather brief early chapters dealing with the nature of the disease, the clinical picture and the clinical examination. Beyond these simplified early chapters, however, the book more than fulfils its purpose—namely, to provide practical education in treating the acute stage of the disease. Nursing care in trunk and limb paralysis is clearly set out, and the handling of bulbar poliomyelitis is well detailed, including innumerable practical points, such as a description of the types of artificial respirator and their use. Useful too are the 'Indications for Respirator', for these are often difficult to assess or define and much depends upon the experience of the attendant medical officer. The Appendix includes details of passive movements and exercises that are advised in treatment, and this useful book concludes with the personal account of a patient's four months in a respirator.

Without doubt this book should be studied by all to whom the management of poliomyelitis is entrusted.

R.S.

CORRESPONDENCE : BRIEWERUBRIEK

THE POSITION REGARDING POLIO VACCINE

I would be grateful to have the hospitality of your columns to explain to the medical profession of South Africa the position regarding the issue of poliomyelitis vaccine.

The Minister of Health appointed a Committee of medical, public health, and virus experts to advise him on the issue of the poliomyelitis vaccine produced in the laboratories of the Poliomyelitis Research Foundation. This Committee has met several times and considered the situation, which became uncertain following on the cases of paralysis which occurred after the administration of certain batches of vaccine in the United States. After fully reviewing all the relevant information this Committee decided to recommend the release for issue of the South African vaccine, after it had been submitted to additional tests to ensure its safety.

These safety tests take up to 3 months to complete and thus only a limited quantity of vaccine is at present available. It has

been necessary to restrict the issue to children under the age of 6, in South Africa, the most susceptible age-group, and to children whose parents bring them into more than usual contact with the poliomyelitis virus. Such parents include doctors, nurses, health officials, and teachers. It has been possible to meet all the requests for these groups which were received up to 22 August, the last day for receiving applications.

Since that date many additional requests have been received and it has not been possible to meet these, or those for children over the age of 6. The names of all applicants have been entered on our lists for consideration when the next batches are issued.

The Priorities Committee of the Union Health Department, which is responsible for the issue of vaccine, has decided that no further issues will be made until next winter. This decision was taken so as to avoid the giving of injections during summer and autumn, when poliomyelitis is most prevalent and when the likelihood of the occurrence of coincidental cases following on the use of vaccine is greatest.

This decision of course does not affect the issue of the vaccine for the second injection to those children in the priority groups who have already had the first injection. This vaccine will be issued during the second half of October and early November so that the second injections can be given about 6 weeks after the first. As before, those to whom vaccine will be issued will be notified beforehand when to expect it.

All medical practitioners and local authorities who have not been supplied with vaccine have been notified by circular letter of the position.

We regret that so many have been disappointed, but we feel that all decisions taken have been in the best interests of the community at the time.

J. H. S. Gear
Director of Research

Laboratories of the Poliomyelitis Research Foundation
Johannesburg
3 October 1955

MEDICAL AID SOCIETIES

To the Editor: I have followed the correspondence on medical aid societies in your *Journal*, and especially the letters by *Fair Play*[1] and *G.P.*[2], with more than average interest, as I have always been vitally interested in the subject and am now chairman of a nation-wide medical aid society.

In view of the fact that the cases cited in the letters concerned, for obvious reasons, do not indicate the society concerned, or its general scope and size, it is difficult, I feel, to draw any general conclusion from the instances quoted. I would prefer to approach the matter from the positive angle and to give your correspondent and all other medical men the assurance that the board of directors of the particular society we serve, is deeply conscious of the fact that the best interests of our members can only be served if there is mutual trust and confidence between the medical men whose patients are members of ours, and the society. I sincerely believe that it is possible to attain the relationship desired both by your correspondent, *Fair Play*, and myself but this, to my mind, can only be achieved by a mutual process of give and take.

I feel we should frankly face the fact that the task of building up a new relationship on such a wide and important sphere of our national life, can never be an easy one. I do believe that the cause of medical aid societies is a good one, both from the standpoint of its members and of doctors. To its members it provides aid at times when they sorely need it; in the case of doctors it provides guarantee against bad debts as well as prompt payment of accounts; more important still is perhaps the very important aspect that, as far as I can determine, it is the only acceptable alternative to State medicine which, I must frankly state, I believe to be neither in the interest of the patient or the doctor.

There is one particular common misunderstanding which calls for comment, and that is on the question of administrative expenses. In nearly every instance it is quite fallacious to express such expenses as a percentage of gross income, and to judge a society by the result. A simple example will show why this is so. Suppose a society charges a subscription rate of 16s. per month and the cost of administration is 4s. per member. This would give an expense ratio of 25%. If subsequently it is found possible to reduce the subscription to 10s. per member, the expense ratio jumps to 40%, but surely the society should not be criticized because of what *G.P.* indicates as a high expense-ratio.

If such an argument was valid, it would only be necessary to increase subscriptions, at the expense of the members, thereby reducing the expense ratio, and presumably becoming more efficient in the eyes of *G.P.* There is, however, a further important consideration: When a society is increasing its membership rapidly, a substantial proportion of the expenses is necessarily devoted to the acquisition of new members, and this cost is paid by the new members, due provision being made under the terms of our constitution.

The need for increasing membership, and thereby achieving greater security for our existing members, is no doubt self-evident. We can show conclusively that the cost of administering the needs of our existing members is nearer 20%, and we know this figure can be improved upon with the growth of the society.

Regarding the question of compulsory membership of a medical aid society, I honestly feel that this is not a case for condemnation, but rather for approbation. After all, none of us would deny the advantages of a compulsory pension-scheme for the employees of a firm.

I think all of us will be prepared to admit that, in whatever profession or business we serve, mistakes are made, often by ourselves. I would therefore sincerely appeal to your readers not to judge medical aid societies too harshly when first a mistake is made, but rather to base their judgment on whether the board of directors or management of the society concerned are prepared to do their utmost to prevent a repetition of the mistake or cause for annoyance. In the case of our own society I, as chairman, knowing the motive which inspires my fellow directors who serve on the Board in a purely unpaid capacity, can undertake that we, as a board, will do our utmost to adjust any grievance or misunderstandings which might be brought to our attention.

In conclusion I would like to thank you in advance for the courtesy of publishing this letter.

J. S. Knight
Chairman
The National Medical Aid Society of South Africa

P.O. Box 4082
Cape Town
26 September 1955

1. *Fair Play* (1955): S. Afr. Med. J., **29**, 852 (3 September).
2. *G.P.* (1955): *Ibid.*, **29**, 900 (17 September).

MEDICAL SALARIES IN THE PUBLIC SERVICE

To the Editor: I agree heartily with the remarks of *Junior Practitioner* in your last issue concerning the totally inadequate salaries paid to medical practitioners in the Public Service and the consequent lack of applicants for these posts. I am 'not so junior a practitioner' but I would willingly and cheerfully give up competitive private practice with its stress and strain for a post in the Public Service if the remuneration was fair and adequate.

The Medical Association is busy boycotting jobs all over the country because of exploitation of the medical profession and thick black lines surround many an advertisement warning the prospective candidate not to apply—but the Public Service is immune from such attention.

During the last Medical Council meeting certain stalwarts turned a complete somersault in 24 hours on the question of the importation of doctors from overseas—thus blighting the prospects of those in the Service for overdue increases in salary and incidentally perpetuating a grievous state of affairs. Some revealing information must have been given.

The statement of the Secretary for Health that in his opinion £1,020 was an adequate salary for a junior medical officer is most unfortunate. Here we have the most senior and responsible official in the Service who considers this salary adequate for a medical man in a full-time capacity. What sort of doctor does he expect to attract to the service? Automatically every married man is barred for obvious reasons.

Unfortunately by agreeing to the importation of doctors from overseas the Medical Council is aiding and abetting the exploitation of doctors who have qualified in this country and are permanent citizens and residents of the country.

Not so Junior a Practitioner

Johannesburg
6 October 1955